

COMMISSION DECISION

Application for Certification

THREE MOUNTAIN POWER PLANT PROJECT

Docket No. 99-AFC-2



May 2001

**CALIFORNIA
ENERGY
COMMISSION**

Gray Davis, Governor

P800-01-017

**CALIFORNIA
ENERGY
COMMISSION**
1516 9th Street
Sacramento, CA 95814

www.energy.ca.gov/sitingcases/threemountain



CALIFORNIA ENERGY COMMISSION

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NOTICE OF AVAILABILITY
of the
COMMISSION DECISION
on the
APPLICATION FOR CERTIFICATION
for the
THREE MOUNTAIN POWER PLANT PROJECT
CEC DOCKET No. 99-AFC-2

The full Commission adopted the Presiding Member's Proposed Decision and ERRATA for the Three Mountain Power Plant Project at its regularly Business Meeting held on May 16, 2001. Copies of the Commission Decision are available from:

Commission Publications Unit,
1516 9th Street, MS-13,
Sacramento, California 95814
Telephone: (916) 654-5200

Refer to Publication No. P800-01-017

The Decision will also be available on the Commission Web Site as follows:

[www.energy.ca.gov/sitingcases/three mountain](http://www.energy.ca.gov/sitingcases/three%20mountain)

Dated: May 30, 2001

**BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION
OF THE STATE OF CALIFORNIA**

IN THE MATTER OF:

**APPLICATION FOR CERTIFICATION OF THE
THREE MOUNTAIN POWER PLANT PROJECT**

DOCKET No. 99-AFC-2

ORDER NUMBER 01-0516-17

ADOPTION ORDER

This Commission Order adopts the Commission Decision on the Three Mountain Power Plant Project. It incorporates the Presiding Member's Proposed Decision (PMPD) in the above-captioned matter and the Committee Errata, dated May 16, 2001 thereto. The Commission Decision is based upon the evidentiary record of these proceedings (Docket No. 99-AFC-2) and considers the comments received prior to the May 16, 2001 business meeting. The text of the attached Commission Decision contains a summary of the proceedings, the evidence presented, and the rationale for the findings reached and Conditions imposed.

This ORDER adopts by reference the text, Conditions of Certification, Compliance Verifications, and Appendices contained in the Commission Decision. It also adopts specific requirements contained in the PMPD which ensure that the proposed facility will be designed, sited, and operated in a manner to protect environmental quality, to assure public health and safety, and to operate in a safe and reliable manner.

FINDINGS

The Commission hereby adopts the following findings in addition to those contained in the accompanying text:

1. The Three Mountain Power Project Project is a merchant power plant whose capital costs will not be borne by the State's electricity ratepayers.
2. The Conditions of Certification contained in the accompanying text, if implemented by the Applicant, ensure that the project will be designed, sited, and operated in conformity with applicable local, regional, state, and federal laws, ordinances, regulations, and standards, including applicable public health and safety standards, and air and water quality standards.

3. Implementation of the Conditions of Certification contained in the accompanying text will ensure protection of environmental quality and assure reasonably safe and reliable operation of the facility. The Conditions of Certification also assure that the project will neither result in, nor contribute substantially to, any significant direct, indirect, or cumulative adverse environmental impacts.
4. Existing governmental land use restrictions are sufficient to adequately control population density in the area surrounding the facility and may be reasonably expected to ensure public health and safety.
5. The evidence of record does not establish the existence of any environmentally superior alternative site.
6. The analysis of record assesses all potential environmental impacts associated with the 500 MW configuration.
7. The Decision contains measures to ensure that the planned, temporary, or unexpected closure of the project will occur in conformance with applicable laws, ordinances, regulations, and standards.
8. The proceedings leading to this Decision have been conducted in conformity with the applicable provisions of Commission regulations governing the consideration of an Application for Certification and thereby meet the requirements of Public Resources Code, sections 21000 et seq., and 25500 et seq.

ORDER

Therefore, the Commission ORDERS the following:

1. The Application for Certification of the Three Mountain Power Project, a limited liability corporation entirely owned by Covanta Energy Americas, Inc. (formerly known as Ogden Corporation), as described in this Decision is hereby approved and a certificate to construct and operate the project is hereby granted.
2. The approval of the Application for Certification is subject to the timely performance of the Conditions of Certification and Compliance Verifications enumerated in the accompanying text and Appendices. The Conditions and Compliance Verifications are integrated with this Decision and are not severable therefrom. While the project owner may delegate the performance of a Condition or Verification, the duty to ensure adequate performance of a Condition or Verification may not be delegated.

3. For purposes of reconsideration pursuant to Public Resources Code section 25530, this Decision is deemed adopted when filed with the Commission's Docket Unit.
4. For purposes of judicial review pursuant to Public Resources Code section 25531, this Decision is final thirty (30) days after its filing in the absence of the filing of a petition for reconsideration or, if a petition for reconsideration is filed within thirty (30) days, upon the adoption and filing of an Order upon reconsideration with the Commission's Docket Unit.
5. The Commission hereby adopts the Conditions of Certification, Compliance Verifications, and associated dispute resolution procedures as part of this Decision in order to implement the compliance monitoring program required by Public Resources Code section 25532. All conditions in this Decision take effect immediately upon adoption and apply to all construction and site preparation activities including, but not limited to, ground disturbance, site preparation, and permanent structure construction.
6. The Executive Director of the Commission shall transmit a copy of this Decision and appropriate accompanying documents as provided by Public Resources Code section 25537 and California Code of Regulations, title 20, section 1768.

Dated: May 16, 2001

WILLIAM J. KEESE
Chairman

MICHAL C. MOORE
Commissioner

ROBERT A. LAURIE
Commissioner

ROBERT PERNELL
Commissioner

ARTHUR H. ROSENFELD
Commissioner

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INTRODUCTION

A. SUMMARY OF THE PROPOSED DECISION

This Decision contains our rationale for determining that the Three Mountain Power Project (TMPP) complies with all applicable laws, ordinances, regulations, and standards, and may therefore be licensed. It is based exclusively upon the record established during these certification proceedings and summarized in this document. We have independently evaluated this evidence, provided references to the record¹ supporting our findings and conclusions, and specified the measures required to ensure that the TMPP is designed, constructed, and operated in the manner necessary to protect public health and safety, promote the general welfare, and preserve environmental quality.

TMPP is proposed by Three Mountain Power, LLC (Applicant). Three Mountain Power, LLC, is entirely owned by Covanta Energy Americas, Inc. (formerly known as Ogden Power Corporation), an indirect subsidiary of Covanta Energy Group (formerly known as Ogden Energy Group), which is a subsidiary of Covanta Energy Corporation (formerly known as Ogden Corporation). TMPP will be located in the Burney Valley, in the northeastern portion of Shasta County, California. The Project is located approximately 1 mile northeast of the town of Burney, and approximately 45 miles east of Redding, California. The Three Mountain Power Site is located on a 40-acre site that is zoned for industrial use. Approximately one-third of the site is currently developed and used by Burney Mountain Power, which is a 10 MW biomass-fired plant. Burney Mountain Power, an affiliate of Three Mountain Power, LLC, is the lessee of the 40-acre site. The Site is located on State Route 299 northeast of Black Ranch Road between the towns of Burney and Johnson Park in northeast Shasta County. The Facility consists of a power island, administrative building, chemical storage

areas, cooling tower, and other support facilities. The Applicant will employ the most recent combustion turbine technology and a parallel hybrid wet and dry cooling system to create an efficient source of electricity with minimal environmental impacts.

TMPP will be a combined cycle power plant. There will be one power island consisting of two Combustion Turbine Generators (CTGs), two Heat Recovery Steam Generators (HRSGs), a Steam Turbine Generator (STG), a parallel hybrid wet and dry cooling system and a zero-liquid discharge system that eliminates the need for wastewater percolation or evaporation ponds. Natural gas will be the only fuel used by the Facility. An interconnection with the Pacific Gas and Electric (PG&E) natural gas transmission line located southeast of the Site is required to interconnect with the gas supply. Three Mountain Power, LLC is considering two turbine vendors for the CTGs: General Electric (GE 7FA) and Westinghouse (501F). Both turbines have been evaluated in the AFC.

Electricity generated by the Facility will be delivered to the PG&E 230 kilovolt (kV) electrical transmission line. The Facility will be connected to PG&E's 230 kV electrical transmission line via a 2,600-foot electrical transmission tie-in line. The connecting transmission tie-in line will be adjacent to the existing McCloud River Railway right-of-way. To accommodate the additional 500 MW, the existing PG&E transmission lines will require reconductoring along an approximate 60-mile distance. No towers will be replaced and no new towers will be built

Raw water will be supplied to the Facility by the Burney Water District. The total maximum water usage by the Project will be approximately 1250 acre feet per year (AFY). 600 AFY will be new fresh groundwater, up to 350 AFY of groundwater will be shared with the adjacent Burney Mountain Power plant and approximately 300 AFY of wastewater will be reclaimed and diverted from the

¹ All references to the Reporter's Transcript appear as date RT page. The dates refer to 2000 unless otherwise noted. Exhibits that were included in the evidentiary record are cited as "Ex.

Burney Water District Wastewater Treatment Facility. The Burney Water District will construct two new water wells and install 4,700 feet of new water line to provide the fresh groundwater to the Project. Domestic potable water will also be supplied by the Burney Water District. The Burney Water District Wastewater Treatment Facility is adjacent to the Project site, and only a short “over-the-fence” pipeline is required to carry the reclaimed wastewater to the Project. The Facility’s water supply will be secured by entering into a long-term agreement with the Burney Water District. The Burney Water District currently supplies approximately 1,300 acre-feet per year for domestic uses to its customers. It supplies all of its customers with local groundwater.

The Burney Water District is in the process of upgrading and expanding its storage capacity and water delivery system. The Burney Water District will, upon entering into an agreement with Three Mountain Power, LLC, ensure that adequate water can be supplied to the Facility. The Burney Water District’s water supply is more than sufficient to meet existing customer demand and the demands of the Three Mountain Power Facility.

TMPP is designed to have very low emissions of air pollutants in order to meet the current Best Available Control Technology (BACT) requirements. Emissions of oxides of nitrogen (NO_x) will be controlled through the use of selective catalytic reduction (SCR) and low- NO_x combustion technology. Emissions of NO_x will be controlled to 2.5 parts per million volume dry (ppmvd) at 15 percent oxygen (O_2). Emissions of carbon monoxide (CO) will meet BACT requirements. Emissions of volatile organic compounds (VOCs), sulfur dioxide (SO_2), and particulates with an aerodynamic diameter less than 10 microns (PM_{10}) will be as low as possible with current technology and the use of natural gas as the Project’s sole fuel and in no event higher than 5 ppm.

number”. A list of all Exhibits is contained in Appendix C of this Decision.

TMPP electrical output will be sold into the California power markets, as well as to wholesale power consumers pursuant to bilateral sales agreements and other markets. TMPP will operate as a base load unit as market conditions dictate. It is anticipated that 20 to 25 full-time employees will be required for operations and support. The Facility will be staffed and operated 24 hours per day, 7 days per week, except during scheduled outages. Capital costs are estimated at \$300 million. Project construction will require a maximum of 386 workers and an average of 200 workers during a 22-month construction period. Full-scale commercial operation is anticipated by mid- to late-2002. The project labor will be provided by qualified workers from the local region for project construction, maintenance, and operation. Condition **SOCIO-1** ensures that the project owner will make a good faith effort to recruit employees and purchase materials/supplies in the Burney area and Shasta County.

Extensive coordination occurred in the process with numerous local, state, and federal agencies. Applicant and Commission staff worked with the Town of Burney, the Shasta County Planning Department, the Shasta County Air Quality Management District (SCAQMD or Air District), the California Air Resources Board (CARB), the U.S. Environmental Protection Agency (USEPA), the United States Fish & Wildlife Service, the California Department of Fish and Game, the California Department of Health Services, the Regional Water Quality Board, the State Department of Parks and Recreation, the Burney and Shasta County Fire Departments, the California Independent System Operator (Cal-ISO), as well as several Intervenors and the public at large.

SCAQMD was responsible for coordinating input from the USEPA and CARB, in consultation with Commission staff, in drafting its Final Determination of Compliance (FDOC) on the project's conformity with state and federal air quality standards. TMPP has provided more than sufficient offsets to comply with SCAQMD's requirements. The project will use the best available control technology (BACT), identified by SCAQMD, to reduce emissions to levels of

insignificance. The Conditions imposed by SCAQMD are incorporated into this Decision.

Project BACT includes Selective Catalytic Reduction (SCR) control technology to reduce NOx emissions. SCR, the industry standard emission control technology, relies on ammonia in the NOx cleansing process. Offsets include purchased Emission Reductions Credits and a voluntary woodstove/fireplace replacement program.

Intervenors were concerned that project-related water usage would be too great, that air emissions would degrade air quality and cause detrimental health effects from ammonia slip during the SCR process. The evidence of record clearly establishes, however, that the project complies with all applicable federal, state, and local regulatory programs that are designed to protect air quality and public health and safety. Both Staff and Applicant went to great lengths in attempts to satisfy these concerns.

To mitigate potential impacts on the Shasta crayfish, TMPP will fund an enhancement study, up to \$250,000, to develop a physical barrier system that would prevent predators from invading the territory of the Shasta crayfish. Mitigation also includes a \$250,000 grant to the California Department of Parks and Recreation (CDPR) to assist CDPR in providing educational programs at Burney Falls State Park, even though there was no conclusive evidence of significant impact. Specifically, this payment will be used to fund a portion of CDPR's development and construction of an interpretive center to be located in Burney Falls State Park. The evidentiary record reveals a complete examination of potential impacts to protected species under federal, state, and local laws, ordinances, regulations, and standards (LORS).

TMPP will provide about \$2.5 million of property tax revenue for Shasta County and be allocated on a pro rata basis to county government, special districts, and

county schools. Applicant has negotiated mitigation fees with the Burney Fire District.

B. SITE CERTIFICATION PROCESS

The TMPP and its related facilities are subject to Energy Commission licensing jurisdiction. (Pub. Resources Code, §§ 25500 et seq.). During licensing proceedings, the Commission acts as lead state agency under the California Environmental Quality Act (Pub. Resources Code, §§ 25519 (c), 21000 et seq.). The Commission's process and associated documents are functionally equivalent to the preparation of the traditional Environmental Impact Report. (Pub. Resources Code, § 21080.5.) The process is designed to complete the review within a specified time period; a license issued by the Commission is in lieu of other state and local permits. Western was required to conduct its own review and this Decision is our joint product.

The Commission's certification process provides a thorough and timely review and analysis of all aspects of this proposed project. During this process, we conduct a comprehensive examination of a project's potential economic, public health and safety, reliability, engineering, and environmental ramifications.

Specifically, the Commission's process allows for and encourages public participation so that members of the public may become involved either informally, or on a more formal level as an Intervenor with the same legal rights and duties as the project developers. Public participation is encouraged at every stage of the process.

The process begins when an Applicant submits the Application for Certification (AFC). Commission staff reviews the data submitted as part of this AFC, and recommends to the Commission whether the AFC contains adequate information to begin the review. Once the Commission determines that an AFC contains sufficient analytic information, it appoints a Committee of two Commissioners to

conduct the licensing process. This process includes public conferences and evidentiary hearings, as well as providing a recommendation (the Presiding Member's Proposed Decision) to the full Commission concerning a project's conformity with applicable laws, ordinances, regulations, and statutes.

The initial portion of the certification process is weighted heavily toward assuring public awareness of the proposed project and obtaining such further technical information as necessary. During this time, the Commission staff sponsors numerous public workshops at which Intervenor, agency representatives, and members of the public meet with Staff and Applicant to discuss, clarify, and negotiate pertinent issues. Staff then publicizes its initial technical evaluation of a project in a document called the "Preliminary Staff Assessment (PSA)," which is made available for public comment. Staff's responses to public comment on the PSA and its complete analyses are published in the Final Staff Assessment (FSA)."

Following this, the Committee conducts a Prehearing Conference to assess the adequacy of available information, identify issues, and determine the positions of the various participants. Information presented at this event becomes the basis for a Hearing Order that announces and schedules formal evidentiary hearings. At these hearings, all entities that have formally intervened as parties are eligible to present sworn testimony, which is subject to cross-examination by other parties and questioning by the Committee. Members of the public may present comments at these hearings. Evidence adduced during these hearings provides the basis for the Committee's analysis and recommendation to the full Commission.

The Committee's analysis and recommendation appear in the Presiding Member's Proposed Decision (PMPD), which is available for a public review period of at least 30 days. Depending upon the extent of revisions necessary after considering comments received during this period, the Committee may then

elect to publish a revised version. If so, this Revised PMPD triggers an additional 15-day public comment period. Finally, the full Commission decides whether to accept, reject, or modify the Committee's recommendations at a public hearing.

Throughout the licensing process, members of the Committee, and ultimately the Commission, serve as fact-finders and decision-makers. Other parties, including the Applicant, Commission staff, and formal intervenors, function independently and with equal legal status. An "ex parte" rule prohibits parties from communicating on substantive matters with the decision-makers, their staffs, or assigned hearing officer unless these communications are made on the public record. The Office of the Public Adviser is available to inform members of the public concerning the certification proceedings, and to assist those interested in participating.

C. PROCEDURAL HISTORY

Public Resources Code, sections 25500 et seq. and Commission regulations (20 Cal. Code of Regs., § 1701, et seq.) mandate a public process and specify the occurrence of certain necessary events. The key procedural elements that occurred in the present case are summarized below.

On March 3, 1999, Applicant filed its Application for Certification (AFC) seeking approval from the Commission to construct and operate the 500-megawatt facility. On April 14, 1999, the full Commission accepted the AFC as data adequate in order to commence the 12-month review process.

The Committee published a notice of Informational Hearing and Site Visit on August 16, 1999. The notice was sent to all entities who were known to be interested in the proposed project, including the owners of property adjacent to or in the vicinity of TMPP. This notice was also published in a local general circulation newspaper.

The Committee conducted the Informational Hearing and Site Visit on Monday, August 16, 1999, at the Lions Hall in Burney, California. At this event, the Committee, Ogden Energy, Inc., and other participants discussed the proposed project, described both the Energy Commission's and the Applicant's review processes, and identified the opportunities for public participation. The parties also toured the site where the project will be situated.

Intervenors participating as formal parties in this proceeding were: California Unions for Reliable Energy; the Burney Resource Group; Black Ranch, Hathaway Burney Ranch FLP; Mr. Claude Evans, a resident of Burney; California Department of Parks and Recreation; Transmission Agency of Northern California (TANC); Burney Forest Power; and, Henwood Energy Services, Inc.

Subsequently, Commission staff scheduled several public workshops to discuss project details with the parties, agencies and members of the public. These workshops were held in Burney, or via teleconference in Sacramento. The Staff-sponsored workshops were scheduled on August 12, September 21 and 22, November 3 and 4, 1999; January 14, February 3, May 10, June 19, August 29, September 11, 2000; and, February 5, 2001.

The Committee issued its required Scheduling Order on August 31, 1999. Pursuant to this Order, and following additional case development, Commission staff released the Preliminary Staff Assessment (PSA) (Part 1) on December 7, 1999, and released Part 2 of the PSA on December 10, 1999. Subsequent to the release of the PSA, the Committee conducted a Status Conference on December 20, 1999 to review the 12-month schedule. Thereafter, on February 3, 2000, the Committee conducted a Prehearing Conference to assess the status of the case and determine whether substantive issues required adjudication.

After considering the comments of all parties, the Committee subsequently considered the date for issuance of the Final Staff Assessment, which was filed in three parts on January 21, 2000 (Part 1), November 3, 2000 (Part 2), and November 21, 2000 (Part 3). The Committee then scheduled the commencement of formal evidentiary hearings, which were conducted in Sacramento on March 7 and 21, 2000, in Redding on December 18 and 19, 2000, and in Sacramento on March 6, 2001. The Committee received testimony and evidence at the evidentiary hearings. After reviewing the evidentiary record and briefs of the parties, the Committee published this Presiding Member's Proposed Decision on April 13, 2001.

I. PROJECT PURPOSE AND DESCRIPTION

The Three Mountain Power Limited Liability Company (“Applicant”), a subsidiary of Covanta Energy Group (formerly known as Ogden Energy Group) was established to develop the Three Mountain Power Project (TMPP), a nominal 500 megawatt (MW) natural gas fired, merchant-class electrical generating project on private property in northeastern Shasta County, approximately one mile northeast of the town of Burney. (Ex. 7, p. 1.)

SUMMARY OF THE EVIDENCE

The site is located on a 40-acre site that is zoned for industrial use. Approximately one-third of the site is currently developed and used by Burney Mountain Power, LLC, which operates a 10 megawatt (MW) biomass-fueled power plant. The site is located on State Route 299 northeast of Black Ranch Road between the towns of Burney and Johnson Park, (Township 35 North, Range 3 East, on Assessor's Parcel Number 030-390-36). (Ex. 64, p. 9.) (See Project Description Figures 1 and 2, in Exhibit 64, at pages 10 and 11.) Applicant will use a temporary construction laydown area on this site. Access to the site will be provided from State Route 299 by Energy Drive, an existing paved private access road. (Ex. 56, p. 84; Ex. 66, Project Description Testimony of Les Toth, p. 2.)

The Project will occupy an unused 10.2-acre portion of the parcel in the southern corner of the existing 40-acre parcel for the power island, wet/dry hybrid cooling system and associated buildings and equipment. A 5-acre portion of the existing 40-acre parcel west of the railroad right-of-way will be used for the water clean-up system and the wastewater clean-up system. A 200-foot by 400-foot area located in the northeast portion of the parcel will house the new PG&E substation. A lot split delineating new and separate parcels for Burney Mountain Power and Three Mountain Power has been approved by the Shasta County

Planning Department. Burney Mountain Power will occupy one parcel and Three Mountain Power will occupy the other parcel. The Project will be located on a relatively undeveloped portion of the site that has been used in the past for wood and timber storage. A 50 foot wide buffer will be maintained on the east and west sides of the site to mask visual impacts. The nearest residence is located approximately 1,400 feet west of the property boundary on Black Ranch Road. The site is also bordered on the west by the Burney Water District Wastewater Treatment Facility. The nearest town is Johnson Park, located northeast of the site, which has a population of approximately 500. The nearest residences in Johnson Park are approximately 1,800 feet from the northeastern corner of the Project site. (Ex. 66, Project Description Testimony of Les Toth, p. 2.)

The Project will be a combined cycle power plant. The power island will consist of two combustion gas turbine generators (CTG), two heat recovery steam generators (HRSG), and one steam turbine generator (STG) in a “2-on-1” arrangement. The design of the 500 MW nominal combined cycle power plant will incorporate state-of-the-art F-Class combustion turbine technology. The power island will consist of two CTGs, two HRSGs, and one STG in a “2-on-1” arrangement. Each CTG will directly produce approximately 170 MW of electricity at standard International Standards Organization (ISO) conditions. The CTG exhaust gas will be used to generate steam in the HRSG by passing through various tube bundles as it moves horizontally along with boiler then turns vertically and exits the stack. The HRSGs will use reheat design with duct firing in a three-pressure level arrangement. Steam from the HRSGs will be admitted to a condensing steam turbine generator for electrical power generation. Up to 230 MW of additional power will be produced by the steam turbine at standard conditions. The duct firing option is provided on the HRSGs to allow for added steam production and the associated increased output from the STG, especially during the hot summer months. (Ex. 66, Project Description Testimony of Les Toth, p. 2.) The combined cycle configuration will incorporate water treatment equipment, air compressor, inlet air evaporative coolers, turbine and generator

set, continuous emission monitors, control room and administrative building, step-transformers, heat recovery steam generators, a steam turbine, two 140 foot exhaust stacks, a hybrid cooling system (consisting of both wet and dry cooling towers), selective catalytic reduction (SCR) and aqueous ammonia storage and handling equipment. (Ex. 64, p. 12.)

The combustion turbine will use dry low NO_x technology combustors with a post-treatment SCR system to meet or exceed the Best Available Control Technology (BACT) limits established under California (and federal) law. In addition, the HRSG will include a CO catalyst section. The Applicant plans to incorporate the latest advancements in combined cycle technology to achieve low heat rate and high efficiency, while at the same time achieving high availability and reliability. The heart of the combined cycle system is the prime mover. Three Mountain Power intends to choose the prime mover manufacturer following a competitive bidding process to be conducted prior to detailed engineering. At the present time, the Westinghouse 501F single-shaft, two-bearing support design with cold end generator design and the General Electric 7FA machine with similar design are being considered. (Ex. 66, Project Description Testimony of Les Toth, p. 3.)

A combination parallel hybrid wet/dry cooling system will be utilized to minimize water use for steam condensation. TMPP's parallel hybrid wet/dry cooling system will use no more than 950 acre-feet per year (AFY) of fresh groundwater. Of this 950 AFY of fresh groundwater, no more than 600 AFY will be fresh groundwater that is not currently being used for power plant cooling purposes. The remaining 350 AFY of fresh groundwater reflects the amount of fresh groundwater that historically has been used by the adjacent Burney Mountain Power (BMP) plant. To make this 350 AFY of fresh groundwater available for the Project, the BMP plant will be retrofitted with a new dry cooling system. Therefore, the Project and the adjacent BMP plant will share the 350 AFY that historically has been used exclusively by the BMP plant. If BMP is shut down,

the full 350 AFY will be available for use by TMPP. All the fresh groundwater used by the Applicant will come from the Burney Water District (BWD).² BMP will continue to use the existing well on the site for its water supply source. BMP will install a water meter and will report its monthly water use to TMPP. TMPP will ensure that the combined fresh water use by BMP and TMPP does not exceed 950 acre-feet per year. In addition, the BWD will reclaim and make available to TMPP, to the extent available, wastewater that is currently being discharged by the adjacent Burney Water District Wastewater Treatment Facility to their wastewater percolation ponds. Historically, this has been approximately 300 AFY. The total maximum water usage by the Project will be approximately 1250 AFY. 600 AFY will be new fresh groundwater, up to 350 AFY of groundwater will be shared with the adjacent BMP plant and approximately 300 AFY of wastewater will be reclaimed and diverted from the Burney Water District Wastewater Treatment Facility. The BWD will construct two new water wells and install 4,700 feet of new water line to provide the fresh groundwater to the Project. Domestic potable water will also be supplied by the BWD. The Burney Water District Wastewater Treatment Facility is adjacent to the Project site, and only a short “over-the-fence” pipeline is required to carry the reclaimed wastewater to the Project. (Ex. 66, Project Description Testimony of Les Toth, pp. 3-4.)

TMPP will include a zero-liquid discharge (ZLD) system that eliminates the need for wastewater percolation or evaporation ponds. This system consists of a side stream softener, a reverse-osmosis (RO) system, a brine concentrator (or evaporator), and a crystallizer. A side stream softener provides silica and hardness reduction allowing the cooling tower cycles of concentration to be increased to approximately twenty. Cooling tower blowdown is further

² Because there will not be a water line between the existing BMP well and the TMPP facility, TMPP will not be able to use the existing BMP well. Accordingly, all fresh groundwater used by TMPP, including its portion of BMP Water, will come from the new BWD wells through the 4,700 ft. new 24 inch pipeline to the TMPP property line and through the new BWD water. (Ex. 64, p. 13.)

concentrated in an RO system. RO product water is reused as cooling tower make-up and RO reject is sent to the brine concentrator/crystallizer system. This brine concentrator/crystallizer system allows for complete reuse of all process waste streams. As a result, no process wastewater will exit the facility. Solids that accumulate in the softener and crystallizer will be disposed of by transfer to a landfill. (Ex. 66, Project Description Testimony of Les Toth, p. 4.)

The project will connect to Pacific Gas & Electric's (PG&E) 230 kilovolt (kV) network adjacent to the existing McCloud River Railway right-of-way utilizing a new PG&E 230 kV switchyard via two new double circuit 230 kV lines and a new 230 kV single circuit transmission line from the TMPP switchyard to the PG&E switchyard. A new PG&E switchyard will be located on the project site. The line connecting the TMPP facility to PG&E's switchyard will be a 230 kV single circuit transmission line. The tie-in with the existing PG&E 230 kV Pit River hydro transmission line is approximately 800 feet west and then 1800 feet in a northerly direction adjacent to the McCloud River Railroad easement. The Pit #1-Pit #3 230 kV transmission circuit and the Pit #1-Cottonwood 230 kV transmission circuit will be intersected and looped to the new PG&E switchyard. To accommodate the TMPP power output, 60 lineal miles of reconductoring³ utilizing existing towers to the Round Mountain and Cottonwood substations is proposed. (Ex. 64, p. 16.)

TMPP will use natural gas supplied through a new 12-inch 2,900-foot-long pipeline to be constructed to interconnect with the PG&E natural gas transmission line located east of the Project site. (Ex. 64, p.14; Ex. 66, Project Description Testimony of Les Toth, p. 4.)

The project is estimated to have a capital cost of about \$250 million. The applicant plans to complete construction and start operation of the TMPP by the

³ "Reconductoring" consists of removing the old insulators, installing new insulators and replacing the old conductors with new conductors with a higher capacity.

third quarter of 2002. During construction, an average of approximately 200 workers would be employed. During operation, the TMPP would employ 20 to 25 full-time staff. Construction is expected to require 18 months. See the **Socioeconomic** section of this decision for additional details on project construction schedule and the work force necessary to support this project. See the **Waste Management** section of this decision for discussion of disposal of wastes generated during construction. The overall sequence of construction and start-up includes: site preparation, construction foundations, erecting major structures, installing major equipment, connecting major site interfaces (pipelines and transmission line), start-up testing, and final siting cleanup and landscaping. (Ex. 64, p. 16.)

FINDINGS AND CONCLUSIONS

1. Applicant proposes to construct and operate the Three Mountain Power Project (TMPP), a 500 MW (nominal) power plant consisting of two natural gas fired, F-class combustion turbine generators, two heat recovery steam generators and one steam turbine generator in a “2-on-1” arrangement with exhaust stacks 140 feet in height, a high voltage switchyard, other power generation equipment, and auxiliary facilities.
2. The project site will be located in northeast Shasta County on a 40-acre privately owned that has been split into two parcels for this project.
3. Linear facilities include a new 2900-foot gas pipeline, a new 4700-foot water supply pipeline, and a new 2600-foot 230 kV double circuit overhead transmission line.

We conclude that the Three Mountain Power Project is described in sufficient detail to allow review in compliance with the provisions of both the Warren-Alquist Act and the California Environmental Quality Act (CEQA).

II. NEED CONFORMANCE

Prior to January 1, 2000, the Public Resources Code directed the Commission to perform an “integrated assessment of need,” taking into account 5 and 12-year forecasts of electricity supply and demand, as well as various competing interests, and to adopt the assessment in a biennial electricity report. In certification decisions, the Commission was required to find that a proposed power plant was in conformance with the Commission’s integrated assessment of need for new resource additions. [Pub. Resources Code, §§ 25523(f) and 25524(a).]

Effective January 1, 2000, Senate Bill 110 (Stats. 1999, ch. 581) repealed Sections 25523(f) and 25524(a) of the Public Resources Code, and amended other provisions relating to assessment of need for new resources. Specifically, it removed the requirement that the Commission make a finding of need conformance in a certification decision. Senate Bill 110 states in pertinent part:

Before the California electricity industry was restructured, the regulated cost recovery framework for power plants justified requiring the commission to determine the need for new generation, and site only power plants for which need was established. Now that power plant owners are at risk to recover their investments, it is no longer appropriate to make this determination. (Pub. Resources Code, § 25009, added by Stats. 1999, ch. 581, § 1.)

As a result of this legislation, an application for certification (AFC) that reaches final Commission decision after January 1, 2000 is not subject to a determination of need conformance. Since the final decision on the AFC in this case will occur *after* January 1, 2000, the Commission is not required to include a need conformance finding.

III. PROJECT ALTERNATIVES

For projects such as the Three Mountain Power Project that have been exempted from the Notice of Intention requirements of Public Resources Code section 25540.6, the Commission is required to examine the "...feasibility of available site and facility alternatives ... which substantially lessen the significant adverse impacts of the proposal on the environment." (Cal. Code of Regs., tit. 20, § 1765.) This inquiry must also comply with California Environmental Quality Act (CEQA) Guidelines, which require an evaluation of the comparative merits of a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project as well as an evaluation of the 'no project' alternative. These alternatives must be considered unless we can make a finding that the project does not have any significant or potentially significant effect on the environment. (Cal. Code of Regs., tit. 14, § 15252.)

Even though our regulatory program is certified as being exempt from the requirement of preparing an Environmental Impact Report (Cal. Code of Regs., tit. 14, §§ 15250-15251), the range of alternatives we are required to consider is still governed by a rule of reason. This means that our consideration of alternatives may be limited to those that would avoid or substantially lessen any of the significant effects while continuing to attain most of the basic objectives of the project. We need not include those alternatives whose effects cannot be reasonably ascertained and whose implementation is remote and speculative. (See, e.g., Cal. Code of Regs., tit. 14, § 15126(d) (5).)

SUMMARY OF THE EVIDENCE

The evidence of record describes the methodology used to analyze project alternatives and includes a discussion of alternative technologies and alternative project sites as well as the "no project alternative."

1. Methodology

Staff used the following methodology in preparing the alternatives analysis:

- Describe the project objectives.
- Identify any potential significant environmental impacts of the project.
- Evaluate the environmental impacts of not constructing the project to determine whether the “no project” alternative is superior to the project as proposed.
- Evaluate alternative technologies.
- Determine which, if any, of the potential significant environmental impacts could potentially be avoided by use of an alternative site.
- Develop screening criteria for feasibility of alternative sites.
- Select a reasonable range of alternative sites that:
 - Meet most of the basic objectives of the project;
 - Avoid or substantially lessen one or more of the potential significant effects of the project; and
 - Satisfy the feasibility screening criteria.
- If any alternative sites are deemed infeasible, explain why.
- Evaluate the environmental impacts of each feasible alternative site.

In its Preliminary Staff Assessment, Staff initially found that the project posed potential significant adverse impacts in the technical areas of air quality, water resources, biological resources, and cultural resources. (Ex. 65, p. 10.) However, since then, based on additional information and with satisfactory implementation of proposed mitigation measures, staff concluded that the potential environmental impacts of the project would be less than significant (see the air quality, water resources, biological resources, and cultural resources sections of this Decision). Therefore, staff did not conduct detailed environmental evaluation of alternatives. (*Ibid.*; 12/18 RT 31-32.)

2. Project Objectives

Analysis of project alternatives begins with an identification of project objectives.

Staff found the applicant's stated objectives for the project are to:

- Expedite construction and operation schedules by using an existing site under applicant's control.
- Use a readily available, secure water supply for the facility's cooling water, and a readily available means of handling wastewater discharge.
- Use a site with appropriate geological conditions, including geotechnical compatibility and consideration of local floodplain characteristics.
- Maximize compatibility with existing land use and zoning.
- Maximize local community acceptability with consideration of noise, public health, worker safety, and hazardous materials handling issues.
- Maximize local community acceptability with consideration of noise, public health, worker safety, and hazardous materials handling issues.
- Maximize the project's ability to meet air quality requirements.
- Minimize the miles of new transmission line construction required to connect with the existing Pacific Gas and Electric (PG&E) 230 kilovolt (kV) transmission line.
- Minimize the construction distance of the natural gas tie-in line to the PG&E natural gas transmission line.
- Minimize the project's visibility and impacts on visual resources.
- Minimize the impact on endangered species and their habitats.
- Minimize the impact on cultural resources. (Ex. 64, p.9.)

3. Generation Technology Alternatives

Staff considered options that do not require the construction of a natural gas-fired facility such as demand side management,⁴ distributed generation and the use of non-fossil fuel technologies. Staff concluded that distributed generation is not a

⁴ Public Resources Code section 25305(c) excludes consideration of demand side management measures as alternatives in a siting case. Staff, however, provided a discussion of demand side management in the FSA. (Ex. 65, pp. 21-22.)

feasible alternative to the proposed project because of technical, institutional, and regulatory barriers. Some types of distributed generation also are not feasible alternatives because they are not presently economical, and others are also not feasible because they have the potential to cause significant unmitigated environmental impacts. (Ex. 65, p. 22.)

Staff compared various non-fossil fuel technologies with the proposed project, scaled to meet the project's objectives. Staff examined the principal renewable electricity generation technologies that could serve as alternatives to the proposed project and do not burn fossil fuels. These technologies are geothermal, solar, hydroelectric, wind, and biomass. Each of these technologies could be attractive from an environmental perspective because of the absence or reduced level of air pollutant emissions. However, these technologies also cause environmental consequences and have feasibility problems.

Solar, wind, and hydroelectric resources require large land areas in order to generate 600 megawatts of electricity. Specifically, centralized solar projects using the parabolic trough technology require approximately 5 acres per megawatt. This 600 MW plant would require approximately 3,000 acres. Photovoltaic arrays require similar acreage per megawatt. Centralized wind generation areas generally require 40-50 acres per megawatt, with 600 megawatts requiring 24,000 - 30,000 acres. Large hydroelectric facilities generating 600 megawatts would inundate at least 30,000 acres with water. These technologies have the potential to cause significant land use, biological, cultural resource, and visual impacts. In summary, staff does not believe that these alternatives would be environmentally preferable to the proposed project.

Staff also considered the alternative of a biomass facility. However, biomass facilities are generally in the 3 to 10 MW range, must overcome significant fuel source reliability issues, have difficulty being economically competitive, and are typically worse from an air quality perspective than natural gas. For these

reasons such a project would not be a feasible alternative, nor would it be likely to sufficiently satisfy project goals.

Severe resource constraints also exist for most of the renewable technologies. Geothermal resources sufficient to generate substantial amounts of electricity are not available. Opportunities for new hydroelectric, wind, or biomass generation are very limited. (Ex. 65, p. 25.)

4. Alternative Sites

In evaluating alternative sites, consideration was given to the underlying objectives of the project, as well as several criteria identified by Applicant for choosing the preferred site location:

- To minimize the miles of new transmission line construction required to connect with the existing PG&E 230 kV transmission line. (This does not include the 60 linear miles of reconductoring of PG&E's transmission lines that the proposed project would require.);
- To expedite construction and operation schedules by using an existing site under Three Mountain Power, LLC's control;
- To use a readily available, secure water supply for the facility's cooling water, and a readily available means of handling wastewater discharge;
- To maximize compatibility with existing land use and zoning;
- To minimize the construction distance of the natural gas tie-in line to the PG&E natural gas transmission line.
- To minimize the Project's visibility and impacts on visual resources;
- To maximize local community acceptability with consideration of noise, public health, worker safety, and hazardous materials handling issues;
- To minimize the impact on endangered species and their habitats;
- To use a site with appropriate geological conditions, including geotechnical compatibility and consideration of local floodplain characteristics;

- To minimize the impacts on cultural resources; and
- To maximize the Project's ability to meet air quality requirements. (Ex. 65, pp. 18-20.)

The preliminary evaluation indicated that all of the alternative sites were approximately equal in regard to most environmental subjects, but three of them were environmentally preferable to the other alternatives. (Ex. 65, pp. 18-21.) As noted above, however, no detailed environmental evaluation was made of any of these alternate sites in light of the Staff finding (with which we concur) that, with the Conditions of Certification contained in this Decision, the environmental impacts of the project are less than significant.

5. No Project Alternative

Our regulations require consideration of the "no project" alternative. This alternative assumes that the project is not built. It is compared to the proposed project and determined to be superior, equivalent, or inferior to it. Not constructing and operating the proposed project would avoid all environmental impacts that the project would create, including increased groundwater use, air emissions, and the need for transmission line reconductoring. However, because we believe that all environmental impacts can be mitigated to a level of less than significant, the benefits of the no project alternative would not be substantial. (Ex. 65, p. 25.) We also note that the 'no project' alternative would eliminate economic benefits to Shasta County and the Burney area, including increased property taxes, employment, sales taxes, and sales of services, manufactured goods, and equipment. (See the **Socioeconomics** section of this Decision.)

FINDINGS AND CONCLUSIONS

Based on the uncontroverted evidence of record, the Commission makes the following Findings:

1. The project site, which is located on privately held property, is a undeveloped parcel that is zoned for industrial uses.
2. The evidentiary record contains a review of alternative technologies, fuels, and the 'no project' alternative.
3. No feasible technology alternatives such as geothermal, hydroelectric, solar, or wind resources are located near the project or are capable of meeting project objectives.
4. The use of alternative generation technologies or cooling technologies would not prove efficient, cost effective or mitigate any significant environmental impacts to greater levels of insignificance than the proposed project description.
5. The evidentiary record does not establish that significant environmental impacts would be avoided under the 'no project' alternative.
6. The evidentiary record contains an adequate analysis of alternative site locations.

If all Conditions of Certification contained in this Decision are implemented, construction and operation of the Three Mountain Power Project will not create any significant direct, indirect, or cumulative adverse environmental impacts. We therefore conclude that the record of evidence contains sufficient analysis of alternatives to comply with the requirements of the Warren-Alquist Act and the California Environmental Quality Act and their implementing regulations.

IV. COMPLIANCE AND CLOSURE

Public Resources Code section 25532 requires the Commission to establish a post-certification monitoring system. The purpose of this requirement is to assure that certified facilities are constructed and operated in compliance with applicable laws, ordinances, regulations, and standards, as well as the specific Conditions of Certification contained in this Decision.

SUMMARY OF THE EVIDENCE

The evidence of record contains a full explanation of the purposes and intent of the Compliance Plan (Plan). The Plan is the administrative mechanism used to ensure that the Three Mountain Power Project is constructed and operated according to the Conditions of Certification. It describes the respective duties and expectations of the project owner and the Staff Compliance Project Manager in implementing the design, construction, and operation criteria set forth in this Decision. Compliance with the Conditions of Certification contained in this Decision is verified through mechanisms such as periodic reports and site visits. The Plan also contains requirements governing the planned closure, as well as the unexpected temporary and unexpected permanent closure, of the project. (Ex. 56, pp. 373, 380.)

The Compliance Plan is composed of two broad elements. The first element is the "General Conditions". These General Conditions:

- set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
- set forth the requirements for handling confidential records and maintaining the compliance record;
- state procedures for settling disputes and making post-certification changes;

- describe requirements for periodic compliance reports and other administrative procedures necessary to verify the compliance status of all Commission imposed conditions; and
- establish requirements for facility closure plans.

The second element of the Plan is the “Specific Conditions of Certification.” These are found following the summary and discussion of each individual topic area in this Decision. The individual conditions contain measures required to mitigate potentially adverse project impacts to insignificant levels. Each condition also includes a "verification" provision describing the method of assuring that the condition has been satisfied.

The contents of the Compliance Plan are intended to be read in conjunction with any additional requirements contained in the individual Conditions of Certification.

FINDINGS AND CONCLUSIONS

The evidence of record establishes:

1. The Compliance Plan and the specific Conditions of Certification contained in this Decision assure that the Three Mountain Power Project will be designed, constructed, operated, and closed in conformity with applicable law.
2. Requirements contained in the Compliance Plan and in the specific Conditions of Certification are intended to be read in conjunction with one another.
3. Applicant has acknowledged and is in agreement with the applicability of all conditions imposed in this Decision.

We therefore conclude that the compliance and monitoring provisions incorporated as a part of this Decision satisfy the requirements of Public Resources Code, section 25532. Furthermore, we adopt the following Compliance Plan as part of this Decision.

COMPLIANCE PLAN

GENERAL CONDITIONS OF CERTIFICATION

COMPLIANCE PROJECT MANAGER (CPM) RESPONSIBILITIES

A CPM will oversee the compliance monitoring and shall be responsible for:

1. ensuring that the design, construction, operation, and closure of the project facilities is in compliance with the terms and conditions of the Commission Decision;
2. resolving complaints;
3. processing post-certification changes to the conditions of certification, project description, and ownership or operational control;
4. documenting and tracking compliance filings; and,
5. ensuring that the compliance files are maintained and accessible.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies and the Energy Commission when handling disputes, complaints and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval, it should be understood that the approval would involve all appropriate staff and management.

The Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Commission about power plant construction or operation-related questions, complaints or concerns.

PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements contained in the Energy Commission's conditions of certification to confirm that they have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings shall ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight or inadvertence and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the

certification process may need to be publicly noticed unless they are confined to administrative issues and process.

ENERGY COMMISSION RECORD

The Energy Commission shall maintain as a public record, in either the Compliance file or Docket file, for the life of the project (or other period as required):

6. all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
7. all monthly and annual compliance reports filed by the project owner;
8. all complaints of noncompliance filed with the Energy Commission; and,
9. all petitions for project or condition changes and the resulting staff or Energy Commission action taken.

PROJECT OWNER RESPONSIBILITIES

It is the responsibility of the project owner to ensure that the general compliance conditions and the conditions of certification are satisfied. The general compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, compliance conditions, or ownership. Failure to comply with any of the conditions of certification or the general compliance conditions may result in reopening of the case and revocation of Energy Commission certification, an administrative fine, or other action as appropriate.

ACCESS

The CPM, responsible Energy Commission staff, and delegate agencies or consultants, shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the records maintained on site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time.

COMPLIANCE RECORD

The project owner shall maintain project files on-site or at an alternative site approved by the CPM, for the life of the project. The files shall contain copies of all “as-built” drawings, all documents submitted as verification for conditions, and all other project-related documents for the life of the project, unless a lesser period is specified by the conditions of certification.

Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files.

COMPLIANCE VERIFICATIONS

Each condition of certification is followed by a means of “verification”. The verification describes the Energy Commission’s procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified, as necessary by the CPM, and in most cases without full Energy Commission approval.

Verification of compliance with the conditions of certification can be accomplished by:

10. reporting on the work done and providing the pertinent documentation in monthly and/or annual compliance reports filed by the project owner or authorized agent as required by the specific conditions of certification;
11. appropriate letters from delegate agencies verifying compliance;
12. Energy Commission staff audit of project records; and/or
13. Energy Commission staff inspection of mitigation and/or other evidence of mitigation.
14. Verification lead times (e.g., 90,60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the involved condition(s) of certification by condition number and include a brief description of the subject of the submittal.** The project owner shall also identify those submittals **not** required by a condition of certification with a statement such as: “This submittal is for information only and is not required by a specific condition of certification.” When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.

The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All submittals shall be addressed as follows:

**Compliance Project Manager
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814**

If the project owner desires Energy Commission staff action by a specific date, they shall so state in their submittal and include a detailed explanation of the effects on the project if this date is not met.

COMPLIANCE REPORTING

There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

COMPLIANCE MATRIX

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide the CPM with the current status of all compliance conditions in a spreadsheet format. The compliance matrix must identify:

15. the technical area,
16. the condition number,
17. a brief description of the verification action or submittal required by the condition,
18. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.),
19. the expected or actual submittal date,
20. the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable, and
21. the compliance status for each condition (e.g., “not started”, “in progress” or “completed date”).

Completed or satisfied conditions do not need to be included in the compliance matrix after they have been identified as completed/satisfied in at least one monthly or annual compliance report.

PRE-CONSTRUCTION MATRIX

Prior to commencing construction a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with

the project owner's **first** compliance submittal. It will be in the same format as the compliance matrix referenced above.

TASKS PRIOR TO START OF CONSTRUCTION

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Project owners frequently anticipate starting project construction as soon as the project is certified. In some cases it may be necessary for the project owner to file submittals prior to certification if the required lead-time extends beyond the date anticipated for start of construction. It is also important that the project owner understand that pre-construction activities that are initiated prior to certification are performed at the owner's own risk. Failure to allow specified lead-time may cause delays in start of construction.

Various lead times for verification submittals to the CPM for conditions of certification are established to allow sufficient staff time to review and comment, and if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

MONTHLY COMPLIANCE REPORT

The first Monthly Compliance Report is due the month following the Energy Commission business meeting date that the project was approved, unless the otherwise agreed to by the CPM. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the Key Events List. The Key Events List is found at the end of this section.

During pre-construction and construction of the project, the project owner or authorized agent shall submit Monthly Compliance Reports within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain at a minimum:

22. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
23. documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;
24. an initial, and thereafter updated, compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);

25. a list of conditions which have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;
26. a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;
27. a cumulative listing of any approved changes to conditions of certification;
28. a listing of any filings with, or permits issued by, other governmental agencies during the month;
29. a projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance conditions of certification;
30. a listing of the month's additions to the on-site compliance file; and
31. any requests to dispose of items that are required to be maintained in the project owner's compliance file.
32. a listing of complaints, notices of violation, official warnings, and citations received during the month; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

ANNUAL COMPLIANCE REPORT

After the air district has issued a Permit to Operate, the project owner shall submit Annual Compliance Reports in addition to Monthly Compliance Reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by the CPM. Each Annual Compliance Report shall identify the reporting period and shall contain the following:

33. an updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
34. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
35. documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Annual Compliance Report;
36. a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;

37. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
38. a listing of filings made to, or permits issued by, other governmental agencies during the year;
39. a projection of project compliance activities scheduled during the next year;
40. a listing of the year's additions to the on-site compliance file, and
41. an evaluation of the on-site contingency plan for unexpected facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section].
42. a listing of complaints, notices of violation, official warnings, and citations received during the year; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

CONFIDENTIAL INFORMATION

Any information, which the project owner deems confidential shall be submitted to the Energy Commission's Docket with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information, which is determined to be confidential, shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq.

DEPARTMENT OF FISH AND GAME FILING FEE

Pursuant to the provisions of Fish and Game Code Section 711.4, the project owner shall pay a filing fee in the amount of eight hundred and fifty dollars (\$850). The payment instrument shall be provided to the Commission's Project Manager at the time of project certification and shall be made payable to the California Department of Fish and Game. The Commission's Project Manager will submit the payment to the Office of Planning and Research at the time of filing of the notice of decision pursuant to Public Resources Code Section 21080.5.

REPORTING OF COMPLAINTS, NOTICES, AND CITATIONS

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering, with date and time stamp recording. The telephone number shall be posted at the project site and easily visible to passersby during construction and operation.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt, to the CPM. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the Complaint Form which follows:

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made which provide the flexibility to deal with the specific situation and project setting which will exist at the time of closure. LORS pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure.

PLANNED CLOSURE

This planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

UNEXPECTED TEMPORARY CLOSURE

This unplanned closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency.

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency

PROJECT NAME: AFC Number:	
COMPLAINT LOG NUMBER _____ Complainant's name and address:	
Phone number:	
Date and time complaint received: Indicate if by telephone or in writing (attach copy if written): Date of first occurrence:	
Description of complaint (including dates, frequency, and duration):	
Findings of investigation by plant personnel:	
Indicate if complaint relates to violation of a CEC requirement: Date complainant contacted to discuss findings:	
Description of corrective measures taken or other complaint resolution:	
Indicate if complainant agrees with proposed resolution: If not, explain:	
Other relevant information:	
If corrective action necessary, date completed: Date first letter sent to complainant: _____ (copy attached) Date final letter sent to complainant: _____ (copy attached)	
This information is certified to be correct. Plant Manager's Signature: _____ Date: _____	

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plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned.

GENERAL CONDITIONS FOR FACILITY CLOSURE

PLANNED CLOSURE

In order that a planned facility closure does not create adverse impacts, a closure process, that will provide for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the CPM). The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.

The plan shall:

- identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site.
- identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;
- identify any facilities or equipment intended to remain on site after closure, the reason, and any future use; and
- address conformance of the plan with all applicable laws, ordinances, regulations, standards, local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

Also, in the event that there are significant issues associated with the proposed facility closure plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Commission may hold public hearings as part of its approval procedure.

In addition, prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Commission CPM for the purpose of discussing the specific contents of the plan.

As necessary, prior to, or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety or the environment, but shall not commence any other closure activities, until Commission approval of the facility closure plan is obtained.

UNEXPECTED TEMPORARY CLOSURE

In order to ensure that public health and safety and the environment are protected in the event of an unexpected temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety, and environmental impacts, are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less than 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days (unless other arrangements are agreed to by the CPM), the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment (also see specific conditions of certification for the technical areas of Hazardous Materials Management and Waste Management).

In addition, consistent with requirements under unexpected permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the on-site contingency plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

In the event of an unexpected temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, etc., within 24 hours and shall take all necessary steps to implement the

on-site contingency plan. The project owner shall keep the CPM informed of circumstances and expected duration of the closure.

If the CPM determines that a temporary closure is likely to be permanent, or for a duration of more than twelve months, a closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

UNEXPECTED PERMANENT CLOSURE

The on-site contingency plan required for unexpected temporary closure shall also cover unexpected permanent facility closure. All of the requirements specified for unexpected temporary closure shall also apply to unexpected permanent closure.

In addition, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the unlikely event of abandonment.

In the event of an unexpected permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, etc., within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

A closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the permanent closure (or other period of time agreed to by the CPM).

DELEGATE AGENCIES

To the extent permitted by law, the Energy Commission may delegate authority for compliance verification and enforcement to various state and local agencies that have expertise in subject areas where specific requirements have been established as a condition of certification. If a delegate agency does not participate in this program, the Energy Commission staff will establish an alternative method of verification and enforcement. Energy Commission staff reserves the right to independently verify compliance.

In performing construction and operation monitoring of the project, the Energy Commission staff acts as, and has the authority of, the Chief Building Official (CBO). The Commission staff retains this authority when delegating to a local CBO. Delegation of authority for compliance verification includes the authority for enforcing codes, the responsibility for code interpretation

where required, and the authority to use discretion as necessary, in implementing the various codes and standards.

Whenever an agency's responsibility for a particular area is transferred by law to another entity, all references to the original agency shall be interpreted to apply to the successor entity.

ENFORCEMENT

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Commission Decision.

Moreover, to ensure compliance with the terms and conditions of certification and applicable laws, ordinances, regulations, and standards, delegate agencies are authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1230 et. seq., but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by current law or regulations.

INFORMAL DISPUTE RESOLUTION PROCEDURE

The following procedure is designed to informally resolve disputes concerning interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate this procedure for resolving a dispute. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents.

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1230 et. seq., but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The procedure encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be referred to the full Energy Commission for consideration via the complaint and investigation process. The procedure for informal dispute resolution is as follows:

REQUEST FOR INFORMAL INVESTIGATION

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and within seven (7) working days of the CPM's request, provide a written report of the results of the investigation, including corrective measures proposed or undertaken, to the CPM. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to provide an initial report, within forty-eight (48) hours, followed by a written report filed within seven (7) days.

REQUEST FOR INFORMAL MEETING

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within fourteen (14) days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

- immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;
- secure the attendance of appropriate Energy Commission staff and staff of any other agency with expertise in the subject area of concern as necessary;
- conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner; and,

- after the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum which fairly and accurately identifies the positions of all parties and any conclusions reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et. seq.

FORMAL DISPUTE RESOLUTION PROCEDURE-COMPLAINTS AND INVESTIGATIONS

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution process, such party may file a complaint or a request for an investigation with the Energy Commission's General Counsel. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230 et. seq.

The Chairman, upon receipt of a written request stating the basis of the dispute, may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Commission shall have the authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction (Title 20, California Code of Regulations, sections 1232 - 1236).

POST CERTIFICATION CHANGES TO THE COMMISSION DECISION: AMENDMENTS, INSIGNIFICANT PROJECT CHANGES AND VERIFICATION CHANGES

The project owner must petition the Energy Commission, pursuant to Title 20, California Code of Regulations, section 1769, to 1) delete or change a condition of certification; 2) modify the project design or operational requirements; and 3) transfer ownership or operational control of the facility.

A petition is required for **amendments** and for **insignificant project changes**. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the Commission's Docket in accordance with Title 20, California Code of Regulations, section 1209.

The criteria that determine which type of change process applies are explained below.

AMENDMENT

A proposed change will be processed as an amendment if it involves a change to the requirement or protocol (and in some cases the verification) portion of a condition of certification, an ownership or operator change, or a potential significant environmental impact.

INSIGNIFICANT PROJECT CHANGE

The proposed change will be processed as an insignificant project change if it does not require changing the language in a condition of certification, have a potential for significant environmental impact, and cause the project to violate laws, ordinances, regulations or standards.

VERIFICATION CHANGE

The proposed change will be processed as a verification change if it involves only the language in the verification portion of the condition of certification. This procedure can only be used to change verification requirements that are of an administrative nature, usually the timing of a required action. In the unlikely event that verification language contains technical requirements, the proposed change must be processed as an amendment.

KEY EVENT LIST

PROJECT _____ DATE ENTERED _____

DOCKET # _____ PROJECT MANAGER _____

<i>EVENT DESCRIPTION</i>	<i>DATE ASSIGNED</i>
Date of Certification	
Start of Construction	
Completion of Construction	
Start of Operation (1st Turbine Roll)	
Start of Rainy Season	
End of Rainy Season	
Start T/L Construction	
Complete T/L Construction	
Start Fuel Supply Line Construction	
Complete Fuel Supply Line Construction	
Start Rough Grading	
Complete Rough Grading	
Start of Water Supply Line Construction	
Completion of Water Supply Line Construction	
Start Implementation of Erosion Control Measures	
Complete Implementation of Erosion Control Measures	

V. ENGINEERING ASSESSMENT

The broad engineering assessment conducted for the Three Mountain Power Project consists of separate analyses that examine facility design, as well as the efficiency and reliability of the proposed power plant. These analyses include the onsite power generating equipment and the project-related linear facilities (transmission line, natural gas supply pipeline, and water supply pipeline).

A. FACILITY DESIGN

The review of facility design covers several technical disciplines, including the civil, electrical, mechanical, and structural engineering elements related to project design, construction, and operation.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The Application for Certification (AFC) describes the preliminary facility design for the project.⁵ The Commission's analysis is limited, therefore, to assessing whether the power plant and linear facilities are described with sufficient detail to assure that the project can be designed and constructed in accordance with applicable engineering laws, ordinances, regulations, and standards (LORS). The analysis also considers whether special design features will be necessary to deal with unique site conditions that could impact public health and safety, the environment, or the operational reliability of the project.

Staff proposed several Conditions of Certification, adopted by the Commission to ensure compliance with LORS and protection of the environment and public health and safety. Some of these facility design conditions address the roles, responsibilities and qualifications of TMPP's engineers responsible for the design

⁵ Ex. 1, §§ 2, 8, Appendices M, N, O, P, Q, R, and S.

and construction of the project.⁶ (Ex. 56, p. 313.) The project will be designed and constructed in conformance with the latest edition of the California Building Code (currently the 1998 CBC) and other applicable codes and standards in effect at the time initial designs are submitted for review. (Ex. 1, §§ 8.1.3, 8.2.1; Ex. 18, p. 2; Ex. 56, p. 307.) Condition **GEN-1** incorporates this requirement.

Staff reviewed the preliminary project design with respect to site preparation and development; major project structures, systems and equipment; civil and structural features, mechanical systems; electrical systems; and ancillary facilities such as the gas pipeline and water systems. (Ex. 56, pp. 307-312.)

The project will employ site preparation and development criteria consistent with accepted industry standards. This includes design practices and construction methods for grading, flood protection, erosion control, site drainage, and site access. (*Id.*, at p. 307.) Condition **CIVIL-1** ensures that these activities will be conducted in compliance with applicable LORS.

Major structures, systems, and equipment include those structures and associated components or equipment necessary for power production or facilities used for storage of hazardous or toxic materials. (Ex. 56, p. 307.) Condition **GEN-2** includes a list of the major structures and equipment for the project.

The power plant site and ancillary facility corridors are located in Seismic Zone 3, the second highest level of potential ground shaking in the country, but the lowest level assigned to the State of California. (Ex. 18, p. 2; Ex. 56, p. 306.) The 1998 CBC requires specific “lateral force” procedures for different types of structures to determine their seismic design. (Ex. 56, p. 308.) To ensure that project structures are analyzed using the appropriate lateral force procedure, Condition **STRUC-1** requires the project owner to submit its proposed lateral

⁶ Conditions **GEN-1 – GEN-8**.

force procedures to the Chief Building Official (CBO)⁷ for review and approval prior to the start of any increment of construction. (*Id.*, p. 309.)

Applicant proposes, and Staff concurs, that small, lightly loaded structures, not subject to vibratory loading be supported on shallow footings or mat foundations on properly compacted fill or undisturbed native soils. Foundation depth should extend to at least 12 inches below lowest adjacent grade. If any portion of the foundation bears on bedrock, the entire foundation should be deepened to bear on bedrock. Large, heavily loaded structures, and structures subjected to vibratory loading, should be constructed on deepened foundations that bear on bedrock. Such foundations may include deepened footing or concrete reinforced pier and grade beams. The power plant and related facilities shall be designed to meet the seismic requirements of the latest edition of the California Building Code. (*Id.*, p. 309.)

The major features of the 500 MW power plant are the two power trains with two natural gas fired, F-class combustion turbine generators (CTG), each 170 MW, operating in combined cycle mode. The CTGs will be installed in a two-on-one configuration with one steam turbine generator (STG) capable of producing up to 230 MW of additional power. The heat from hot exhaust gas, which flows from each CTG through a heat recovery steam generator (HRSG), will be extracted to produce steam to power the STG. A combination parallel hybrid wet/dry cooling system will be utilized to minimize water use for steam condensation. (Ex. 66, Testimony of Les Toth on Project Description, p. 3.) Air emissions from the combustion of natural gas in the CTGs and duct burners will be controlled using state-of-the-art combustion technology. The combustion turbine will use dry low NO_x technology combustors with a post-treatment selective catalytic reduction (SCR) system to meet or exceed state and federal control technology

⁷ The CBO is the Commission's duly appointed representative, who may be the County Chief Building Official, or other appointed representative.

requirements. In addition, the HRSG will include a CO catalyst section. (Ex. 56, p. 310; Ex. 66, Testimony of Les Toth on Project Description, p. 3.)

Other mechanical features include water and wastewater treatment facilities, a zero-liquid discharge system, pressure vessels, inlet air chillers, piping systems and pumps; aqueous ammonia storage, handling and piping system; air compressors; fire protection systems; and heating, ventilation, air conditioning (HVAC), potable water, plumbing and sanitary sewage systems. (Ex. 56, p. 310; Ex. 66, Testimony of Les Toth on Project Description, p. 4.)

The mechanical systems for the project are designed to the specifications of applicable LORS. Conditions **MECH-1** through **MECH-4** ensure that the project complies with these standards.

Major electrical features other than the transmission system include generators, power control wiring, protective relaying, grounding system, cathodic protection system and site lighting. (Ex. 1, Appendix Q.) Conditions **ELEC-1** and **ELEC-2** ensure that design and construction of these electrical features will comply with applicable LORS.

Ancillary facilities include a new Pacific Gas and Electric (PG&E) Substation in the northeast portion of the property and the new 2,600-foot overhead electric transmission line to connect this new substation to the two existing PG&E 230kV transmission lines. (Ex. 66, Testimony of Les Toth on Project Description, pp. 2, 4.) Other facilities are new natural gas pipelines and water supply and delivery systems. (Ex. 56, pp. 311-312.) The project owner will comply with all applicable LORS in the design and construction of these facilities. (Ex. 66, Testimony of Les Toth on Project Description, p. 4.) The transmission facilities will be designed, constructed, and operated according to Conditions **TSE-1** through **TSE-3** in the **Transmission System Engineering** section of this Decision.

The TMPP is seeking certification for a 2900-foot natural gas pipeline interconnection to a PG&E natural gas transmission line located east of the project. (Ex. 66, Testimony of Les Toth on Project Description, p. 4.)

The evidence also addresses potential project closure. (Ex. 56, pp. 314-315.) Condition **GEN-9**, in conjunction with the general closure provisions in the Compliance Plan (*ante*), specifies closure procedures to ensure compliance with applicable LORS.

Finally, the Conditions of Certification specify the roles, qualifications, and responsibilities of engineering personnel who will oversee project design and construction. These Conditions require the approval of the CBO after appropriate inspections by qualified engineers. No element of construction may proceed without approval of the CBO. (Ex. 56, p. 315.)

FINDINGS AND CONCLUSIONS

Based on the uncontroverted evidence of record, the Commission makes the following findings and conclusions:

1. The Three Mountain Power Project is currently in the preliminary design stage.
2. The evidence of record contains sufficient information to establish that the proposed facility can be designed and constructed in conformity with the applicable laws, ordinances, regulations, and standards set forth in the appropriate portion of Appendix A of this Decision.
3. The Conditions of Certification set forth below are necessary to ensure that the project is designed and constructed both in accordance with applicable law and in a manner that protects environmental quality and public health and safety.
4. The Conditions of Certification below and the provisions of the Compliance Plan contained in this Decision set forth requirements to be followed in the event of facility closure.

We therefore conclude that, with the implementation of the Conditions of Certification listed below, the Three Mountain Power Project can be designed and constructed in conformance with applicable laws.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct and inspect the project in accordance with the 1998 California Building Code (CBC)⁸ and all other applicable LORS in effect at the time initial design plans are submitted to the CBO for review and approval. The CBC in effect is that edition that has been adopted by the California Building Standards Commission and published at least 180 days previously.

Protocol: In the event that the TMPP is submitted to the CBO when a successor to the 1998 CBC is in effect, the 1998 CBC provisions identified herein shall be replaced with the applicable successor provisions. *Where, in any specific case, different sections of the code specify different materials, methods of construction, or other requirements, the most restrictive shall govern.* Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

Verification: Within 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) after receipt of the Certificate of Occupancy, the project owner shall submit to the California Energy Commission Compliance Project Manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable LORS and the Energy Commission's Decision have been met for facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [1998 CBC, Section 109 – Certificate of Occupancy.]

GEN-2 The project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List, and a Master Specifications List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major structures and equipment in **Table 1: Major**

⁸ The Sections, Chapters, Appendices and Tables, unless otherwise stated, refer to the Sections, Chapters, Appendices and Tables of the 1998 California Building Code (CBC).

Equipment List below). To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Protocol: Table 1: Major Equipment List

Quantity*	Description	Size/Capacity*	Remarks
2	CTG – Combustion Turbine	172.5 MW	
2	CTG – Generator Assemblies	187.0 MW	220 MVA/0.85 PF
2	CTG Evaporative Cooler Packages	37-43.5 gpm	Evaporative Media
1	STG – Steam Turbine	220 MW	
1	STG – Generator Assemblies	187 MW	220 MVA/0.85 PF
1	Surface Condenser	1,305.76 MMBtu/hr	2 Pass/ ~150,000 ft ²
1	Induced Draft Cooling Tower	1,250 MMBtu/hr	Counterflow 125,000 gpm/DT=20°F
2	HRSG – Heat Recovery Steam Generators	126'5"x28'8"	3 Pressure levels / Reheat /1,800 psig
2	HRSG – Stack w/ CEM	17'-6" Ø x 140' high	
2	Aqueous Ammonia (NH ₃) Vessels	10,000 gallons	19% solution
1	Pretreatment Water Storage Tank	500,000 gallons	
1	Demineralized Water Storage Tank	150,000 gallons	
1	Condensate Storage Tank	75,000 gallons	
1	Neutralization Storage Tank	75,000 gallons	
2	Circulating Water Pumps	57,750 gpm	1,800 hp ea.
2	Auxiliary Water Pumps	15,000 gpm	600 hp ea.
2	Hotwell Condensate Pumps	2,185 gpm	200 hp ea.
6	HP/IP BFW Pumps	2,150 gpm	3,400 hp ea.
3	18kV/230kV Gen. Step-up XFMR		
2	18kV/4160 V Aux. XFMR		
4	230 kV Circuit Breakers		

***All quantities, capacities and dimensions are approximate and may change during project final design.**

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The project owner shall provide schedule updates in the Monthly Compliance Report.

GEN-3 The project owner shall make payments to the CBO for design review, plan check and construction inspection, equivalent to the fees listed in the 1998

CBC, Chapter 1, Section 107 and Table 1-A, Building Permit Fees; Appendix Chapter 33, Section 3310 and Table A-33-A, Grading Plan Review Fees; and Table A-33-B, Grading Permit Fees. If Shasta County has adjusted the CBC fees for design review, plan check and construction inspection, the project owner shall pay the adjusted fees.

Verification: The project owner shall make the required payments to the CBO at the time of submittal of the plans, design calculations, specifications, or soil reports. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fee has been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project [Building Standards Administrative Code (Cal. Code of Regs., tit. 24, § 4-209, Designation of Responsibilities).]

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

Protocol: The RE shall:

1. Monitor construction progress to ensure compliance with LORS;
2. Ensure that construction of all the facilities conforms in every material respect to the applicable LORS, these Conditions of Certification, approved plans, and specifications;
3. Prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner or as required by conditions on the project;
4. Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;
5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other

engineers who have been delegated responsibility for portions of the project; and

6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications.

The RE shall have the authority to halt construction and to require changes or remedial work, if the work does not conform to applicable requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the name, qualifications and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) are subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; D) a mechanical engineer; and E) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.]

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment

support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project. [1998 CBC, Section 104.2, Powers and Duties of Building Official.]

If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A: The civil engineer shall:

1. Design, or be responsible for design, stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads, and sanitary sewer systems; and
2. Provide consultation to the RE during the construction phase of the project, and recommend changes in the design of the civil works facilities and changes in the construction procedures.

B: The geotechnical engineer or civil engineer, experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports, and prepare final soils grading report;
2. Prepare the soils engineering reports required by the 1998 CBC, Appendix Chapter 33, Section 3309.5 – Soils Engineering Report, and Section 3309.6 – Engineering Geology Report;
3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the

requirements set forth in the 1998 CBC, Appendix Chapter 33, section 3317, Grading Inspections;

4. Recommend field changes to the civil engineer and RE;
5. Review the geotechnical report, field exploration report, laboratory tests, and engineering analyses detailing the nature and extent of the site soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load; and
6. Prepare reports on foundation investigation to comply with the 1998 CBC, Chapter 18 section 1804, Foundation Investigations.

This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations. [1998 CBC, section 104.2.4, Stop orders.]

C: The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;
2. Provide consultation to the RE during design and construction of the project;
3. Monitor construction progress to ensure compliance with LORS;
4. Evaluate and recommend necessary changes in design; and
5. Prepare and sign all major building plans, specifications and calculations.

D: The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform with all of the mechanical engineering design requirements set forth in the Energy Commission's Decision.

E: The electrical engineer shall:

1. Be responsible for the electrical design of the project; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section, 1701.5 Type of Work (requiring special inspection), and Section 106.3.5, Inspection and Observation program.

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;
2. Observe the work assigned for conformance with the approved design drawings and specifications;
3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action; and
4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable provisions of the applicable edition of the CBC.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

Verification: At least 15 days prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 The project owner shall keep the CBO informed regarding the status of engineering and construction. If any discrepancy in design and/or construction is discovered, the project owner shall document the discrepancy and recommend the corrective action required. The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this condition of certification and, if appropriate, the applicable sections of the CBC and/or other LORS.

Verification: The project owner shall submit monthly construction progress reports to the CBO and CPM. The project owner shall transmit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. When the work and the "as-built" and "as graded" plans conform to the approved final plans, the project owner shall notify the CPM regarding the CBO's final approval. The marked up "as-built" drawings for the construction of structural and architectural work shall be submitted to the CBO. Changes approved by the CBO shall be identified on the "as-built" drawings [1998 CBC, Section 108, Inspections.]

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans.

GEN-9 The project owner shall file a closure/decommissioning plan with Shasta County and the CPM for review and approval at least 12 months (or other mutually agreed to time) prior to commencing the closure activities. If the project is abandoned before construction is completed, the project owner shall return the site to its original condition.

The closure plan shall include a discussion of the following:

1. The proposed closure/decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
2. All applicable LORS, all local/regional plans, and a discussion of the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
3. Activities necessary to restore the site if the TMPP decommissioning plan requires removal of all equipment and appurtenant facilities; and
4. Closure/decommissioning alternatives, other than complete restoration of the site.

Verification: At least 12 months prior to closure or decommissioning activities, the project owner shall file a copy of the closure/decommissioning plan with Shasta County and the CPM for review and approval. Prior to the submittal of the closure plan, a meeting shall be held between the project owner and the CPM for discussing the specific contents of the plan.

CIVIL-1 Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils report as required by the 1998 CBC, Appendix Chapter 33, Section 3309.5, Soils Engineering Report and Section 3309.6, Engineering Geology Report.

Verification: At least 15 days prior to the start of site grading, the project owner shall submit the documents described above to the CBO for review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area. [1998 CBC, Section 104.2.4, Stop orders.]

Verification: The project owner shall notify the CPM, within five days, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within five days of the CBO's approval, the project owner shall provide to the CPM a copy of the CBO's approval to resume earthwork and construction in the affected areas.

CIVIL-3 The project owner shall perform inspections in accordance with the 1998 CBC, Chapter 1, Section 108, Inspections; Chapter 17, Section 1701.6, Continuous and Periodic Special Inspection; and Appendix Chapter 33, Section 3317, Grading Inspection. All plant site-grading operations shall be subject to inspection by the CBO and the CPM.

If, in the course of inspection, it is discovered that the work is not being done in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action, and send copies to the CBO and the CPM.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a Non-Conformance Report (NCR), and the proposed corrective action. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following Monthly Compliance Report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage facilities, the project owner shall obtain the CBO's approval of the final "as-graded" grading plans, and final "as-built" plans for the erosion

and sedimentation control facilities [1998 CBC, Section 109, Certificate of Occupancy.]

Verification: Within 30 days of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall submit to the CBO the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of this report to the CPM in the next Monthly Compliance Report.

STRUC-1 Prior to the start of any increment of construction, the project owner shall submit to the CBO for review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for:

1. Major project structures;
2. Major foundations, equipment supports and anchorage;
3. Large field fabricated tanks;
4. Turbine/generator pedestal; and
5. Switchyard structures.

In addition, the project owner shall, prior to the start of any increment of construction, get approval from the CBO of the lateral force procedures proposed for project structures to comply with the lateral force provisions of the CBC.

The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications [1998 CBC, Section 108.4, Approval Required];
3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures at least 90 days (or a lesser number of

days mutually agreed to by the project owner and the CBO), prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation [1998 CBC, Section 106.4.2, Retention of plans and Section 106.3.2, Submittal documents.]; and

4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations and specifications shall be signed and stamped by the responsible design engineer [1998 CBC, Section 106.3.4, Architect or Engineer of Record.]

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of construction, the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

If the CBO discovers non-conformance with the stated requirements, the project owner shall resubmit the corrected plans to the CBO within 20 days of receipt of the nonconforming submittal with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and are in conformance with the requirements set forth in the applicable LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);
2. Concrete pour sign-off sheets;
3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results,

welder qualifications, certifications, qualified procedure description or number (ref: AWS); and

5. Reports covering other structural activities requiring special inspections shall be in accordance with the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section 1701.5, Type of Work (requiring special inspection), Section 1702, Structural Observation and Section 1703, Nondestructive Testing.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the condition(s) of certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 1998 CBC, Chapter 1, Section 106.3.2, Submittal documents, and Section 106.3.3, Information on plans and specifications, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give the CBO prior notice of the intended filing.

Verification: On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the Monthly Compliance Report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in Chapter 3, Table 3-E of the 1998 CBC shall, at a minimum, be designed to comply with Occupancy Category 2 of the 1998 CBC. Chapter 16, Table 16-K of the 1998 CBC requires use of the following seismic design criteria: $I = 1.25$, $I_p = 1.5$ and $I_w = 1.15$.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of installation of the tanks or vessels containing the above specified quantities of highly toxic or explosive substances that would be hazardous to the safety of the general public if released, the project owner shall submit to the CBO for review and approval, final

design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-1 Prior to the start of any increment of piping construction, the project owner shall submit, for CBO review and approval, the proposed final design drawings, specifications and calculations for each plant piping system (exclude domestic water, refrigeration systems, and small bore piping, i.e., piping and tubing with a diameter less than two and one-half inches). The submittal shall also include the applicable QA/QC procedures. The project owner shall design and install all piping, other than domestic water, refrigeration, and small bore piping to the applicable edition of the CBC. Upon completion of construction of any piping system, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 106.3.2, Submittal documents, Section 108.3, Inspection Requests.]

The responsible mechanical engineer shall submit a signed and stamped statement to the CBO when:

1. The proposed final design plans, specifications and calculations conform with all of the piping requirements set forth in the Energy Commission's Decision; and
2. All of the other piping systems, except domestic water, refrigeration systems and small bore piping have been designed, fabricated and installed in accordance with all applicable ordinances, regulations, laws and industry standards, including, as applicable:
 - American National Standards Institute (ANSI) B31.1 (Power Piping Code);
 - ANSI B31.2 (Fuel Gas Piping Code);
 - ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
 - ANSI B31.8 (Gas Transmission and Distribution Piping Code); and
 - Specific City/County Code.

The CBO may require the project owner to employ special inspectors to report directly to the CBO to monitor shop fabrication or equipment installation [1998 CBC, Section 104.2.2, Deputies.]

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of piping construction, the project owner shall submit to the CBO for approval, with a copy of the transmittal letter to the CPM, the above listed documents for that increment of construction of piping systems, including a copy of the signed and stamped engineer's certification of conformance with the Energy Commission's Decision. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation [1998 CBC, Section 108.3 – Inspection Requests.]

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and
2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for review and approval, final design plans, specifications and calculations, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall send copies of the CBO plan check approvals to the CPM in the following Monthly Compliance Report. The project owner shall also

transmit a copy of the CBO's and/or Cal-OSHA inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-3 Prior to the start of construction of any heating, ventilating, air conditioning (HVAC) or refrigeration system, the project owner shall submit to the CBO for review and approval the design plans, specifications, calculations and quality control procedures for that system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the applicable edition of the CBC. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS [1998 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record.]

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, with a copy of the transmittal letter to the CPM.

The project owner shall send copies of CBO comments and approvals to the CPM in the next Monthly Compliance Report. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-4 Prior to the start of each increment of plumbing construction, the project owner shall submit for CBO's approval the final design plans, specifications, calculations, and QA/QC procedures for all plumbing systems, potable water systems, drainage systems (including sanitary drain and waste), toilet rooms, building energy conservation systems, and temperature control and ventilation systems, including water and sewer connection permits issued by the local agency. Upon completion of any increment of construction, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 108.3, Inspection Requests, Section 108.4, Approval Required.]

The project owner shall design, fabricate and install:

1. Plumbing, potable water, all drainage systems, and toilet rooms in accordance with Title 24, California Code of Regulations, Division 5, Part 5 and the California Plumbing Code (or other relevant section(s) of the currently adopted California Plumbing Code and Title 24, California Code of Regulations); and
2. Building energy conservation systems and temperature control and ventilation systems in accordance with Title 24, California Code of Regulations, Division 5, Chapter 2-53, Part 2.

The final plans, specifications and calculations shall clearly reflect the inclusion of approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall stamp and sign all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any of the above systems, the project owner shall submit to the CBO the final design plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the next Monthly Compliance Report following completion of that increment of construction.

ELEC-1 For the 480 volts and higher systems, the project owner shall not begin any increment of electrical construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [1998 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests.]

The following activities shall be reported in the Monthly Compliance Report:

1. receipt or delay of major electrical equipment;
2. testing or energization of major electrical equipment; and
3. the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for electrical equipment and systems 480 volts and greater, including a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

ELEC-2 The project owner shall submit to the CBO the required number of copies of items A and B for review and approval and one copy of item C [CBC 1998, Section 106.3.2, Submittal documents.]

- A. Final plant design plans to include:
 1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems;
 2. system grounding drawings;
 3. general arrangement or conduit drawings; and
 4. other plans as required by the CBO.
- B. Final plant calculations to establish:
 1. short-circuit ratings of plant equipment;
 2. ampacity of feeder cables;
 3. voltage drop in feeder cables;
 4. system grounding requirements;
 5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
 6. system grounding requirements;
 7. lighting energy calculations; and
 8. other reasonable calculations as customarily required by the CBO.
- C. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission Decision.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical equipment installation, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations, for electrical equipment and systems 480 volts and greater enumerated above,

including a copy of the signed and stamped statement from the responsible electrical engineer certifying compliance with the applicable LORS. The project owner shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

B. POWER PLANT EFFICIENCY

The California Environmental Quality Act (CEQA) requires the Commission to examine whether the project's consumption of energy will result in significant adverse environmental impacts on non-renewable energy sources and if so, whether feasible mitigation measures are available to minimize impacts through increased efficiency of design and operation. (Pub. Resources Code, § 21002.)

SUMMARY OF THE EVIDENCE

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. Staff, therefore, reviewed whether TMPP's use of natural gas would result in 1) an adverse effect on local and regional energy supplies and resources; 2) a requirement for additional energy supply capacity; 3) noncompliance with existing energy standards; or 4) the wasteful, inefficient, and unnecessary consumption of fuel or energy.⁹ (Ex. 56, p. 342.)

1. Potential Effects on Energy Supplies and Resources

The project will burn natural gas at a maximum rate exceeding 78 billion Btu per day lower heating value (LHV). (Ex. 56, p. 342.) Although this is a substantial rate of energy consumption, TMPP will burn natural gas from an existing PG&E natural gas pipeline. The gas supply infrastructure is extensive, offering access to vast reserves of gas from both domestic and Canadian sources. This source represents far more gas than would be required for a project this size. It is therefore highly unlikely that the TMPP could pose a substantial increase in demand for natural gas in California. Since these gas reserves greatly exceed

⁹ See, CEQA Guidelines, 14 California Code of Regulations, section 15000 et seq., Appendix F.

project demand, TMPP's use of natural gas will not cause significant impacts to energy supplies and resources. (*Id.*, pp. 342-343.)

2. Depletion of Energy Supply

Natural gas fuel will be supplied to the project by a 2900-foot long, 12-inch diameter pipeline connecting with the PG&E transmission pipeline east of the site and southeast of Highway 199. There is no real likelihood that the TMPP will require the development of additional energy supply capacity. (Ex. 56, p. 343.)

3. Compliance with Energy Standards

No standards apply to the efficiency of TMPP or other non-cogeneration projects. (Ex. 56, p. 343.) See Public Resources Code, section 25134.

4. Alternatives to Wasteful or Inefficient Energy Consumption

The TMPP could be deemed to create significant adverse impacts on energy resources if alternatives existed that would reduce the project's use of fuel. (Ex. 56, p. 343.) Applicant considered alternative generating technologies such as oil-burning, coal-burning, solar, wind, hydroelectric, biomass, and geothermal technologies. (Ex. 1, § 5.2.2.) Given the project objectives, location, and air pollution control requirements, Staff agreed with Applicant's conclusion that only natural gas-burning technologies are feasible. (Ex. 56, p. 344.)

Project fuel efficiency, and therefore its rate of energy consumption, is determined by the configuration of the power producing system and by selection of equipment to generate power. (Ex. 56, p. 343.) TMPP is configured as a compound-train combined cycle power plant. Electricity will be generated by two gas turbines and one steam turbine that operates on heat energy recuperated from gas turbine exhaust. By recovering this heat, which would otherwise be lost

up the exhaust stacks, the efficiency of any combined cycle power plant is increased considerably from that of either gas turbines or steam turbines operating alone. Staff concluded that this configuration is well suited to the large, steady loads met by a baseload plant. (Ex. 56, p. 343.)

The multiple power train configuration will also provide the option of shutting down one of the individual generating components while the remaining turbine will continue to run at full load. Thus, the plant can generate at part load while maintaining optimal efficiency. Additionally, for further operational flexibility, the HRSGs will be equipped with duct burners, to supply additional steam to the steam turbine generator for power augmentation on hot days. This increases maximum power output, and extends the range of power output at which the plant can operate at optimum or near optimum efficiency. (Ex. 56, pp. 343-344.)

Applicant will employ F-class combustion turbine generators from either Westinghouse, model 501F or the General Electric Frame 7FA. (Ex. 66, Testimony of Les Toth on Project Description, p. 4.) The F-class turbines proposed by Applicant are some of the most modern and efficient such machines now available. (Ex. 56, p. 344.) The evidence indicates that Staff also considered other F-class turbines and the alternative G-class turbine, which represent newly developed technology. Although the G-class turbine is slightly more efficient than the F-class turbine, this new technology could potentially restrict TMPP's operating flexibility. Given the likelihood that TMPP would frequently be dispatched at less than full load, and the lack of a proven track record for the G-class turbine, Applicant's choice of the F-class machine is considered reasonable. (Ex. 56, p. 344-345.)

A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler and the chiller; both devices increase power output by cooling the gas turbine inlet air. A chiller can offer greater power output than the evaporative cooler on

hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An evaporative cooler boosts power output best on dry days. It uses less electric power than a chiller, thus yielding slightly higher operating efficiency. The applicant plans to install evaporative cooling. Given the very dry project climate, Staff found this approach to be one that will not yield any adverse energy impact. (Ex. 56, p. 345.)

At least partially in response to expressed concerns regarding water consumption, Applicant modified the project design to use a hybrid wet-dry cooling system in place of the evaporative (wet) cooling system originally proposed. In addition, the existing Burney Mountain Power plant, a 10 MW biomass-fired power plant with an evaporative cooling system located adjacent to the TMPP, will be converted to use a hybrid cooling system. While a 100 percent dry-cooling system can reduce both maximum power output and fuel efficiency on hot days, the benefit is a significant savings in water consumption. A wet cooling system more effectively cools the steam turbine's condenser in hot weather, permitting higher efficiency and greater power output, but at the expense of significantly greater water consumption. (Ex. 64, p. 81.)

The hybrid system proposed in the Mitigation Plan (Attached as Exhibit 3 to Ex. 66, Project Description Testimony of Les Toth) yields many of the benefits of both wet and dry systems, while minimizing the drawbacks of both. When ambient temperature is low enough, the dry cooling system cools the condenser, consuming no water. As temperatures rise, the wet cooling tower is phased in, a cell at a time, to assist in cooling. Only in the hottest conditions will the wet cooling system, with its significant water consumption, be run at full load. The result is maximum power output and fuel efficiency nearly equal to a 100 percent wet-cooling system. The applicant proposes to size the dry portion of the cooling system to carry 100 percent of the load at 48°F, a typical day, and to size the wet portion of the system to carry 100 percent of the load at 98°F, a hot day. (*Id.*, at

p. 2-29.) The project output and efficiency with this wet-dry hybrid system compares favorably with the original proposal as demonstrated by Staff and Applicant. (Ex. 64, pp. 81-82; cf. Ex. 66, Testimony of Mai Hattar on Power Plant Reliability and Efficiency, pp. 2-3.) The effect of substitution of the hybrid cooling system on project power output will be practically nil; the reduction of project fuel efficiency will be so small as to be insignificant. (Ex. 64, p. 82.)

According to the evidentiary record, if TMPP is constructed and operated as proposed, the project would generate 500 MW (nominal) of electricity at an overall project fuel efficiency of approximately 52 percent LHV, compared with the average fuel efficiency of a typical utility company baseload power plant at 35 percent LHV. (Ex. 56, pp. 342, 346; Ex. 64, p. 82.)

FINDINGS AND CONCLUSION

Based on the uncontroverted evidence of record, the Commission makes the following Findings:

1. The Three Mountain Power Project (TMPP) will not create a substantial increase in demand for natural gas.
2. Available gas supplies exceed the fuel requirements of the proposed project.
3. TMPP will not consume natural gas in a wasteful, inefficient, or unnecessary manner.
4. The project's design, incorporating multiple power trains, will allow the power plant to generate electricity at less than full load while maintaining optimal efficiency.
5. TMPP will employ F-class turbines, which are highly efficient and provide the option of operating the project at less than full load.
6. The anticipated operational efficiency of the proposed project is consistent with that of comparable power plants using similar technology and significantly more efficient than the older utility power plants.

7. TMPP will not require the development of any new fuel resources.

The Commission therefore concludes that TMPP will not cause any significant direct or indirect adverse impacts upon energy resources. The project will conform with all applicable laws, ordinances, regulations, and standards relating to fuel efficiency as identified in the pertinent portions of APPENDIX A of this Decision. No Conditions of Certification are required for this topic.

C. POWER PLANT RELIABILITY

The Warren-Alquist Act requires the Commission to examine the safety and reliability of the proposed power plant, including provisions for emergency operations and shutdowns. [Pub. Resources Code, § 25520(b).] There are presently no laws, ordinances, regulations, or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the Commission must determine whether the project will be designed, sited, and operated to ensure safe and reliable operation. [Cal. Code of Regs., tit. 20, § 1752(c)(2).] In this regard, the Commission considers whether the proposed project will degrade the reliability of the utility system to which it is connected. If the project exhibits reliability at least equal to that of other power plants in the system, it is presumed not likely to degrade the system.

In California's competitive electric power industry, the California Independent System Operator, (Cal-ISO) has the primary responsibility for maintaining system reliability. To provide an adequate supply of reliable power, Cal-ISO has imposed certain requirements on power plants selling ancillary services and those holding reliability must-run contracts, such as: 1) filing periodic reports on reliability; 2) reporting all outages and their causes; and 3) scheduling all planned maintenance outages with the Cal-ISO. The Commission believes that merchant power plant owners should continue to maintain the same levels of reliability that the power industry has achieved in recent years.

SUMMARY OF THE EVIDENCE

Staff examined the project's design criteria to determine whether it will be built in accordance with typical power industry norms for reliable electricity generation. (Ex. 56, p. 333.) According to Staff, project safety and reliability are achieved by ensuring equipment availability, plant maintainability, fuel and water availability, and adequate resistance to natural hazards. (*Id.*, p. 334.)

1. Equipment Availability

TMPP will ensure equipment availability by use of quality assurance/quality control programs (QA/QC) typical of the power industry, which include inventory review, and equipment inspection and testing on a regular basis during design, procurement, construction, and operation. (Ex. 1, § 8.3.2.9; Ex. 56, p. 335.) Implementation of these programs will be monitored by appropriate Conditions of Certification, which are included in the **Facility Design** section of this Decision. A hybrid wet-dry cooling system will replace the 100 percent wet-cooling system originally proposed. In addition, the existing Burney Mountain Power Project, a 10 MW biomass-fired power plant with an evaporative cooling system located adjacent to the TMPP, will be converted to use a hybrid cooling system. (Ex. 64, p. 121.)

2. Plant Maintainability

The evidentiary record indicates that project design includes sufficient redundancy of equipment and systems for the combined cycle to ensure continued operation in the event of equipment failure. (Ex. 56, pp. 335-336.) The two parallel trains of gas turbine generators/HRSGs provide inherent reliability. (*Id.*) Failure of a non-redundant component of one power train will not cause the other train to fail; rather, the plant will continue to generate at reduced output. This ability to continue operation even with equipment failure demonstrates adequate equipment redundancy to meet typical industry reliability standards. (Ex. 56, p. 336.) TMPP proposes to establish a plant maintenance program typical of the industry. (Ex. 56, p. 336.) The dry portion of the hybrid cooling system will add a large radiator and twenty fan/motor assemblies to the project. (Ex. 3 to Ex. 66, Testimony of Les Toth on Project Description, p. 3-43.) The radiator, a passive component, is unlikely to hamper reliability. If one or more fan/motor units should be out of service, the remaining units would continue to function, but there would be some performance degradation. (Ex. 66,

Testimony of Mai Hattar on Power Plant Reliability and Efficiency, p. 2.) Degradation in cooling system performance from a few failed units would be minimal. Should the dry cooling system sustain a major failure, the wet cooling system could serve as a redundant system to keep the project operating, with some additional water consumption, until repairs could be completed. (Ex. 64, p. 121.)

3. Fuel and Water Availability

The evidence demonstrates that there is adequate natural gas supply and pipeline capacity to deliver natural gas for project operations. (Ex. 56, p. 336; See, **Power Plant Efficiency** in this Decision.) TMPP will obtain water for cooling and other plant uses from new groundwater wells owned and operated by the Burney Water District. (Ex. 56, p. 336.). Staff implies that this source “may result” in a reliable supply of water for the project. (Ex. 56, p. 337; see also **Soil & Water Resources** in this Decision.) Staff did conclude that, by reducing TMPP’s water consumption, the substitution of a hybrid cooling system makes it less likely that sufficient water will be unavailable. This serves to enhance plant reliability. (Ex. 64, p. 121.) Applicant agrees with this conclusion. (Ex. 66, Testimony of Mai Hattar on Power Plant Reliability and Efficiency, p. 2.) Applicant has demonstrated that the use of the wet-dry cooling system provides a sufficient basis upon which to conclude that a reliable source of sufficient water exists. (Ex. 3 to Ex. 66, Testimony of Les Toth on Project Description, pp. 2-39 – 2-48, 3-3 – 3-7.) The hybrid system, as noted by Staff and Applicant, actually enhances reliability. (Ex. 64, p. 121; Ex. 66, Testimony of Mai Hattar on Power Plant Reliability and Efficiency, p. 2.)

4. Natural Hazards

Natural forces can threaten the reliable operation of a power plant. High winds, flooding, tsunamis (tidal waves) and seiches (waves in inland bodies of water)

will not represent a hazard for this project, but seismic shaking (earthquake) presents a credible threat to reliable operation (see those portions of this Decision entitled **Facility Design** and **Geology and Paleontology**). The site lies within Seismic Zone 3. The project will be designed and constructed to the latest appropriate LORS. Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking, compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. (See that section of this Decision entitled **Facility Design** for a further discussion.) By virtue of being built to the latest seismic design LORS, this project will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes, and we agree, there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events. (Ex. 56. P. 337.) Staff has proposed, and we adopt, conditions of certification to ensure LORS compliance. Those conditions are in that portion of this Decision entitled **Facility Design**.

The evidence therefore establishes that none of the potential natural hazards identified herein will present significant obstacles to the project's safe and reliable operation. (*Ibid.*)

5. Availability Factors

Applicant predicts the project will have an annual availability factor of 90-95 percent. (Ex. 1, § 8.3.2.) Industry statistics for power plant availability are compiled by the North American Electric Reliability Council (NERC). (Ex. 56, p. 337.) NERC's statistics demonstrate an availability factor of 91.10 percent for combined cycle units of all sizes. (*Ibid.*) Although the NERC figure is lower than Applicant's proposed upper limit of availability, Staff reasonably expects that a modern, baseload facility such as TMPP will likely outperform the NERC

average, especially since maintenance can occur when full plant output is not required to meet market demand. (Ex. 56, pp. 337-338.) The evidentiary record thus supports a finding that the proposed 90-95 percent availability factor is consistent with industry norms for power plant reliability. (Ex. 56, p. 338.)

Since the project is designed to conform to industry norms, Staff concluded that TMPP would perform reliably in baseload duty and cause no significant impacts to electric system reliability. (Ex. 56, p. 338.)

FINDINGS AND CONCLUSIONS

Based on the uncontroverted evidence of record, the Commission makes the following findings and conclusions:

1. The Three Mountain Power Project (TMPP) will ensure equipment availability by implementing quality assurance/quality control programs and by providing adequate redundancy of auxiliary equipment to prevent unplanned off-line events.
2. TMPP's two parallel trains of gas turbine generators/HRSGs and one steam turbine generator provide inherent reliability.
3. Planned outages for each of the turbine generators can be scheduled in sequence during times of low regional electricity demand.
4. There is adequate fuel and water availability for project operations.
5. The project is designed to withstand earthquakes to prevent significant hazards to the project's safety or reliability.
6. The project's estimated 90-95 percent availability factor is consistent with industry norms for power plant reliability.
7. TMPP will perform reliably in baseload duty and cause no significant impacts to electric system reliability.

The Commission, therefore, concludes that the project will not have an adverse effect on system reliability. No Conditions of Certification are required for this

topic. To ensure implementation of the QA/QC programs described above, appropriate Conditions of Certification are included in the **Facility Design** portion of this Decision.

D. TRANSMISSION SYSTEM ENGINEERING

The Commission's jurisdiction includes "...any electric power line carrying electric power from a thermal power plant ...to a point of junction with an interconnected transmission system." (Pub. Resources Code, § 25107.) The Commission reviewed the engineering and planning design of Three Mountain Power Project's (TMPP) proposed transmission facilities to ensure that they will be designed, constructed, and operated in compliance with applicable law. These transmission facilities include the power plant switchyard, the transmission outlet lines, and the point of interconnection to the power grid system.

TMPP proposes to connect its project to the Pacific Gas & Electric (PG&E) transmission network adjacent to the McCloud River Railway right-of-way. The California Integrated System Operator (Cal-ISO) is responsible for ensuring system reliability for all participating transmission owning utilities and determines both the standards necessary to achieve reliability and whether a proposed project conforms with those standards. We rely on the Cal-ISO's determinations and findings related to applicable reliability standards and the need for additional transmission facilities. Staff coordinates the Cal-ISO's process and results with our certification process. (Ex. 56, p. 349.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

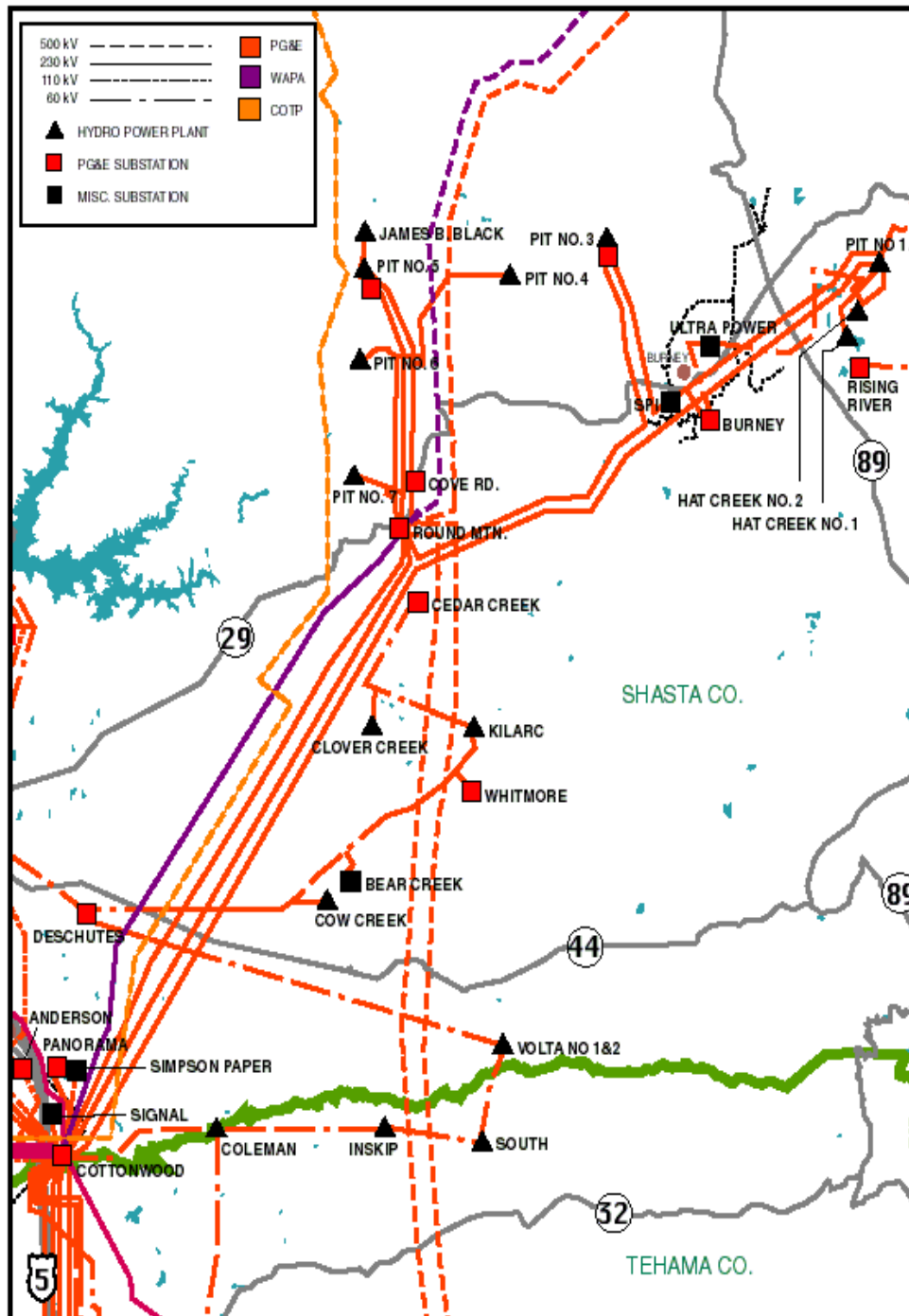
1. Transmission Facilities

TMPP will generate a nominal electrical output of 500 MW for sale into the California electricity market. The project will connect to PG&E's 230 kilovolt (kV) network adjacent to the existing McCloud River Railway right-of-way utilizing a new PG&E 230 kV switchyard via two new double circuit 230 kV lines and a new 230 kV single circuit transmission line from the TMPP switchyard to the PG&E switchyard. (Ex. 1, §§ 2.1, 2.2.1; Ex. 56, p. 351.)

The new PG&E switchyard will be located on the project site northeast of the new power plant facility. The line connecting the TMPP facility to PG&E's switchyard will be a 230 kV single circuit transmission line, which will connect the two switchyards. The tie-in with the existing PG&E 230 kV Pit River hydro transmission line is approximately 800 feet west and then 1800 feet in a northerly direction adjacent to the McCloud River Railway easement. The Pit #1-Pit #3 230 kV transmission circuit and the Pit #1-Cottonwood 230 kV transmission circuit will be intersected and looped to the new PG&E switchyard. To accommodate the TMPP power output, 60 linear miles of reconductoring¹⁰ utilizing existing towers to the Round Mountain and Cottonwood substations is proposed. (Ex. 56, p. 351.) The physical routes of transmission facilities in Northern California are illustrated in **Figure 1**, replicated from Exhibit 56, at page 368. While two circuits of the California Oregon Intertie (COI) are shown, the other 500 kV circuit constituting the COI is to the west and is only partially shown. Power flows in northern California are almost always from north to south on the lines shown because of the large amount of native hydro (2000 MW) and imports on the COI. On vary rare occasions power is transported from south to north on the COI. **Figure 2**, replicated from Exhibit 56, at page 369, shows the existing Pit River hydro transmission lines prior to modification to accommodate the TMPP project.

¹⁰ Reconductoring consists of removing the old insulators, installing new insulators and replacing the old conductors with new conductors with a higher capacity.

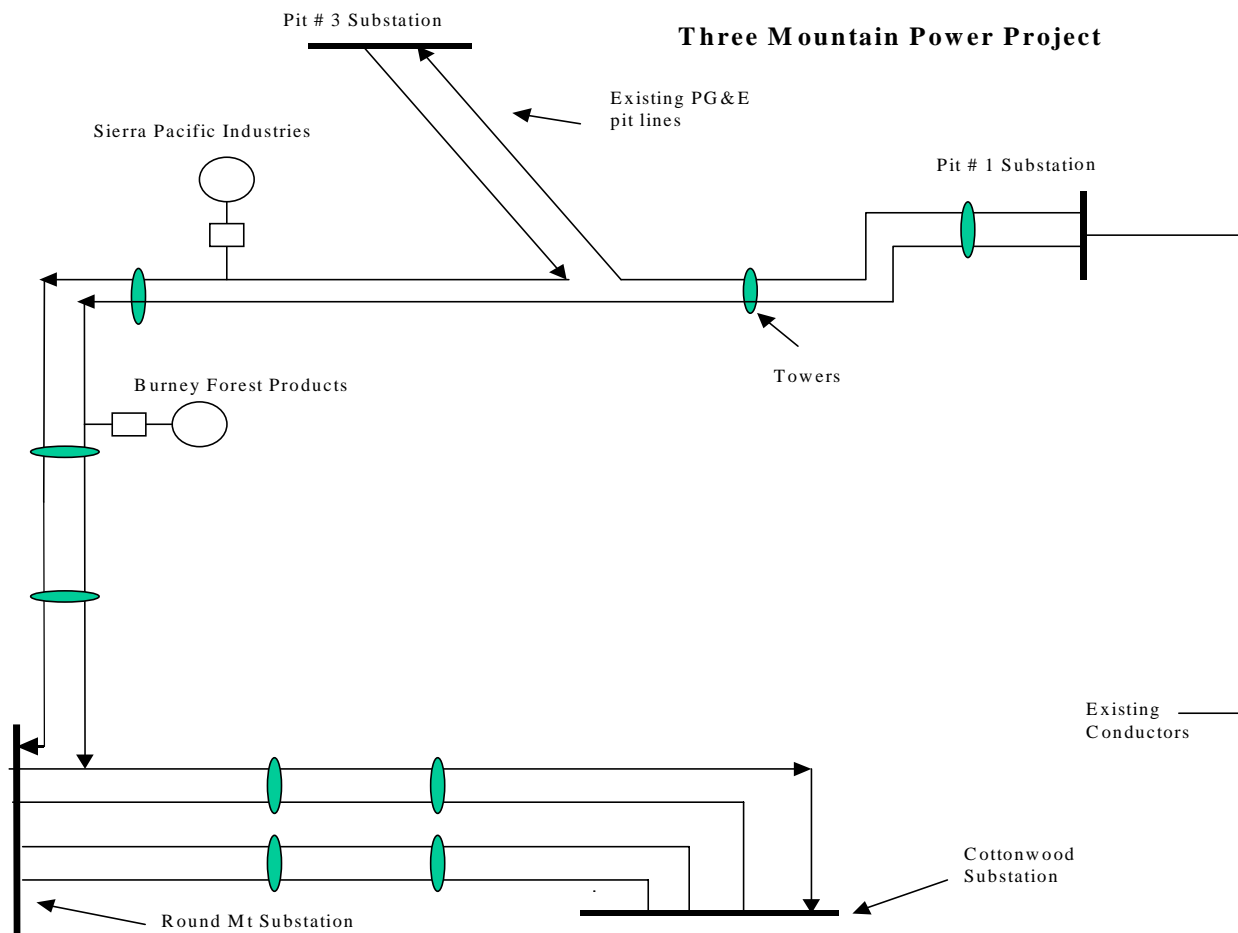
TRANSMISSION SYSTEM ENGINEERING
Figure 1- Transmission Facilities in Northern California



Source: Exhibit 56, p. 368

TRANSMISSION SYSTEM ENGINEERING

Figure 2 - Existing System



Source: Exhibit 56, p. 369

Three separate facilities are proposed to provide a reliable connection to PG&E's existing 230 kV lines in the Burney area. These outlet facilities consist of a new single circuit 230 kV transmission line, a new PG&E 230 kV switchyard and two new 230 kV double-circuit steel pole transmission lines to connect to the existing PG&E Pit River hydro unit lines. To accommodate the power output of the TMPP project, approximately 60 linear miles of PG&E's existing Pit River hydro lines down to the Cottonwood and Round Mountain substation will be reconducted.. (Ex. 56, p. 352.)

The power plant switchyard is located at the project site. It consists of four circuit breakers and four associated disconnect switches. Power is generated by the facility at 18 kV and stepped up to 230 kV by transformers in the power plant switchyard. (Ex. 1, § 2.1.2.1.5; Figure 2.1-8; Ex. 56, p. 352.) The new PG&E switchyard is located 1300 feet from the power plant switchyard and will occupy a rectangular parcel of land 185-feet by 400-feet. The PG&E switchyard configuration is a ring bus scheme to improve reliability over the originally proposed double-bus single breaker station. Five 230 kV circuit breakers, one bus tie breaker for the project and space for four future breakers will be located in the PG&E switchyard (Ex. 1, § 2.2.2.3; Ex. 20, p. 2; Ex. 56, pp. 352.)

The TMPP 230 kV line connecting the project switchyard and the PG&E switchyard will be a 1300 feet long single-circuit line with 795 kcmil ACSS conductors. These conductors are rated at 634 MVA, which is adequate to accommodate the maximum output of the TMPP project (530 MW). The connecting lines from the PG&E switchyard to the existing PG&E lines will be approximately 2600 feet long and consist of two double circuit 230 kV steel pole structures. The pole height is 118-foot minimum and the maximum span is 1000 feet. The 795 kcmil conductors have sufficient ampacity to carry the full output of the TMPP project and the area generation with one circuit out of service. The lines will be designed and constructed to comply with California Public Utilities

Commission General Order 95 and all applicable LORS. (Ex. 1, § 2.2.2.1; Ex. 20, pp. 2-3; Ex. 56, pp. 349-350, 353, 361.) See Condition of Certification **TSE-1**.

The Applicant analyzed one route alternative. The alternative would be to construct a single circuit 230 kV transmission line from the project substation to either Round Mountain (approximately 19 linear miles¹¹) or to the Table Mountain Cottonwood (50 miles) substations. Applicant rejected this option for two reasons. It not only would require additional facilities, it would pass through National Forest, timberland and pastures, a condition the Applicant found to be unacceptable from an environmental point of view. (Ex. 1, § 2.2.4.2; Ex. 56, p. 353.) We agree that the option selected was the appropriate one.

2. System Reliability

PG&E is the transmission owning utility. PG&E will provide interconnection service to the project. Cal-ISO will provide transmission service to the project and will be the agency responsible for maintaining reliability of their controlled grid. As such, Cal-ISO will perform the analysis identifying impacts, recommend the interconnection facilities and any mitigation of downstream facilities required to maintain system reliability, and Cal-ISO will ultimately approve the final interconnection requirements for the project. (Ex. 56, pp. 349, 354.) Cal-ISO has reviewed the Preliminary Facilities Study¹² for the TMPP and has given approval to the study and the proposed interconnection of the project. Cal-ISO concurs with PG&E's findings that interconnection of the TMPP to the ISO-controlled grid will meet all applicable reliability criteria after implementation of the reinforcements and mitigation measures identified in Exhibit 54. (Ex. 54, p. 2; Ex. 56, p. 354.)

Intervenor Transmission Agency of Northern California (TANC) devoted a great deal of testimony and cross-examination to the subject of congestion impacts to

¹¹ In Exhibit 1, the Applicant indicated that the distance is 38 miles.

¹² Attached as Exhibit 2 to Ex. 20, Testimony of Byron Tomlinson.

the ISO-controlled grid and a degradation of reliability that could be caused by the interconnection of TMPP. (See Ex. 51, Ex. 52 and 03/07 RT 25-125, 182-224, 268-283, and 292-293.) Mr. Peter Mackin of the Cal-ISO, sponsored by Staff explained that congestion impact is not the same as reliability impacts. (03/07 RT 140.) Congestion impacts do not in any way degrade the reliability of the ISO-controlled grid. (03/07 RT 140-141.) The environmental impacts asserted by TANC (see, e.g., Ex. 52) are speculative at best. All the evidence indicates that TANC's contractual transmission rights are unaffected by the existence of TMPP. As Mr. Byron Tomlinson's written testimony indicates, congestion impacts are the topic of studies and determinations to be made outside the Commission certification process, including preparation of the Detailed Facilities Study, an Operational Impact Study (OIS), and the development of a Special Mitigation Operating Procedures (SMOP) document. TANC and the Western Area Power Administration are participating¹³ in the preparation of these documents. The OIS assesses the potential impact of the project's interconnection on the north-to-south transfer limits for the California-Oregon Intertie (COI). TMPP will employ Remedial Action Schemes, Operating Procedures and the SMP and will comply with all applicable requirements of the Cal-ISO's Tariff and Protocols, including any applicable congestion management requirements. Such compliance will be required as a condition of the Cal-ISO's Participating Generator Agreement, which TMPP will be required to execute as a condition of its interconnection. (Ex. 20, pp. 3-4.) Conditions **TSE-1**, **TSE-2**, and **TSE-3** ensure this compliance. As noted by Staff, potential overloads under normal conditions will be precluded by utilizing congestion management techniques and impacts under contingency conditions will be alleviated by tripping one or more TMPP generators. (Ex. 56, pp. 357-358.)

¹³ The present tense is used here only to indicate such participation at the time the testimony was prepared in February, 2000.

A system reliability evaluation determines whether the new project would cause thermal overloads, voltage violations (voltages too high or low), and/or electric system instability (excessive oscillations). In addition to the above analysis, studies may be performed to verify that sufficient reactive power is available. The reliability evaluation must be conducted for all credible "emergency" conditions. Emergency conditions could include the loss of a single or double circuit line, the loss of a transformer or generator, or a combined loss of these facilities. A Preliminary Facilities Study is conducted in advance of potential system changes, such as the addition of the TMPP into the system, in order to prevent criteria violations. The criteria used in this evaluation include the WSCC Planning Criteria, NERC Planning Standards and applicable Cal-ISO reliability criteria. The reliability implications of the TMPP and the need for additional facilities will be determined by the Cal-ISO based on the Detailed Facilities Study. As noted above, preliminary determination of compliance with applicable reliability criteria has been provided by the Cal-ISO. (Ex. 56, p. 355.)

Cal-ISO has reviewed TMPP's Preliminary Facilities Study and has concluded that the Preliminary Facilities Study is adequate for the Cal-ISO to grant preliminary interconnection approval. Based on the Preliminary Facilities Study, there are a number of facilities that may need to be reinforced in order for TMPP to be interconnected to Cal-ISO controlled grid. The identified facilities are needed to relieve congestion and maintain system reliability. The criteria violations that will be mitigated by those facilities have been identified in the Cal-ISO's approval letter (see Ex. 54):

- Some frequency deviation criteria violations occur on generator terminal buses.
- Some system overloads occur after TMPP is connected to the system under normal conditions.

The Cal-ISO indicated that further investigation should be performed to determine if the frequency deviation violations would cause a load or generation loss. If no loss of load or generation would occur, modification of the frequency

deviation criteria for these buses could be considered. PG&E will have to perform additional work in the Detailed Facilities Study prior to the Cal-ISO granting final interconnection approval to TMPP. However, it is likely that no downstream facilities not already identified would be required as a result of these additional studies. (Ex. 56, p. 359.)

3. Cumulative Impacts

Staff testified, and we agree, that no cumulative impact analysis was needed relative to this topic. (Ex. 56, p. 359.)

4. Closure

Procedures for planned, unexpected temporary, or permanent closure will be developed to facilitate effective coordination between the project owner and Cal-ISO to ensure safety and system reliability. The CPUC has promulgated rules under General Order 95 (GO-95), such as Rule 21 and Rule 31.6, that will apply to project closure procedures. (Ex. 56, pp. 359-360.) Condition **GEN-9** in the **Facility Design** section requires TMPP to provide a Closure Plan at least 12 months prior to commencing closure activities. The Compliance Plan section of this Decision contains additional provisions to ensure that project closure would be consistent with applicable law.

COMMISSION DISCUSSION

The uncontroverted evidence of record establishes that TMPP's transmission facilities will be designed, constructed, and operated in conformance with applicable law. The Commission relies on Cal-ISO's determinations regarding the project's potential reliability and/or congestion impacts and has adopted Cal-ISO's finding that TMPP can reliably connect to the grid.

FINDINGS AND CONCLUSIONS

Based on the evidence of record, the Commission makes the following findings:

1. Three Mountain Power Project will interconnect with the Cal-ISO controlled grid at the PG&E transmission lines approximately 2600 feet from the project.
2. The project's single circuit overhead line from the power plant switchyard to the PG&E switchyard will provide 530 MW of transfer capability.
3. The overhead lines will be constructed in conformance with PG&E and CPUC design standards.
4. PG&E will perform a final Detailed Facilities Study to analyze the potential reliability and congestion impacts likely to occur when TMPP interconnects to the grid.
5. The issuance of Cal-ISO's final interconnection approval and the WSCC Peer Review Process will assure conformance with NERC, WSCC and Cal-ISO reliability criteria. Condition of Certification **TSE-1(h)** provides for Energy Commission review of the Cal-ISO final interconnection agreement.

The Commission therefore concludes that implementation of the measures specified in the Conditions of Certification listed below will ensure that TMPP's transmission facilities are designed, constructed, and operated in compliance with all applicable laws, ordinances, regulations, and standards relating to transmission system engineering as identified in APPENDIX A of this Decision.

CONDITIONS OF CERTIFICATION

TSE-1 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to requirements listed below. The substitution of Compliance Project Manager (CPM) approved "equivalent" equipment and equivalent switchyard configurations is acceptable.

- a. The power plant switchyard will contain four 230 kV circuit breakers and associated disconnect switches. The PG&E switchyard will consist of a ring bus configuration with 5 circuit breaker bays with associated disconnected switches.
- b. Breakers and bus in the power plant substation and other substations where applicable shall be sized to comply with a short circuit analysis.

- c. The transmission facilities shall meet or exceed the requirements of CPUC General Order 95.
- d. Approximately 60 linear miles of the existing PG&E Pit River hydro 230 kV lines shall be reconducted to the Round Mountain and Cottonwood substations. The new conductors will be placed on the existing towers with minor modification of tower arms, with one conductor per phase. Insulator removal and placement of new insulators shall be performed by helicopter and the existing conductors shall be removed by withdrawal via the old conductors.
- e. Termination facilities shall comply with applicable Cal-ISO and PG&E interconnection standards (PG&E Interconnection Handbook and CPUC Rule 21).
- f. Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner/operator no later than 30 days prior to planned construction and comply with the owner's standards
- g. The new transmission facilities shall use steel pole construction and conductors, which could be as small as 795 kcmil (Condor) aluminum conductor, steel-supported (ACSS) cable. Larger conductors resulting in more than minor modifications to the existing PG&E Pit River hydro lines shall not be used without written authorization of the CPM
- h. The applicant shall provide a Detailed Facilities Study including a description of RAS sequencing and timing and an executed Facility Interconnection Agreement for the Three Mountain Power Project transmission interconnection with PG&E. The Detailed Facility Study shall include the analysis recommended by the Cal-ISO (Cal-ISO 1999a) and shall evaluate reactive margin for the SMUD and adjacent service areas. The Detailed Facilities Study and Interconnection Agreement shall be coordinated with the Cal-ISO and shall comply with the Cal-ISO's tariffs.
- i. Sustained outages of the Pit River # 1, Pit River # 3, Sierra Pacific Industries, Burney Forest Products, Round Mountain, and Cottonwood substations and parallel lines, where applicable, due to construction activities shall be coordinated with the owner/operator of these facilities and minimized commensurate with CPUC General Order 95 and good engineering practices.

Verification: At least 60 days prior to start of construction or modification of transmission facilities or switchyards, the project owner shall submit for approval to the CPM, electrical one-line diagrams signed and sealed by a registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements 1a through 1i above. Substitution of equipment and line or substation configurations shall be identified and justified by the project owner for CPM approval.

TSE-2 The project owner shall inform the CPM of any impending changes, which may not conform to the requirements 1a through 1i of **TSE-1**, and have not received CPM approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment, transmission facilities or switchyard configurations shall not begin without prior written approval of the changes by the CPM.

Verification: At least 60 days prior to construction of transmission facilities, the project owner shall inform the CPM of any impending changes which may not conform to requirements of **TSE-1** and request approval to implement such changes.

TSE-3 The project owner shall be responsible for the inspection of the transmission facilities during project construction and any subsequent CPM approved changes thereto, to ensure conformance with CPUC GO-95, PG&E Interconnection Handbook, Cal-ISO tariffs and CPUC Rule No. 21 and these conditions. In case of non-conformance, the project owner shall inform the CPM in writing within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after synchronization of the project, the project owner shall transmit to the CPM an engineering description(s), and one-line drawings of the "as-built" facilities signed and sealed by a registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95, PG&E Interconnection Handbook, Cal-ISO tariffs, CPUC Rule No. 21 and these conditions shall be concurrently provided.

E. TRANSMISSION LINE SAFETY AND NUISANCE

The project transmission line must be constructed and operated in a manner that protects environmental quality, assures public health and safety, and complies with applicable law. This analysis reviews the potential impacts of the project transmission line on aviation safety, radio-frequency interference, audible noise, fire hazards, nuisance shocks, hazardous shocks, and electric and magnetic field exposure.

SUMMARY OF THE EVIDENCE

1. Description of Transmission Line

Energy from the proposed Three Mountain Power Project (TMPP) will be transmitted through a 1300-foot single-circuit 230 kV line connecting the TMPP switchyard to a new 230 kV PG&E switchyard on the northeast corner of the project site. From the new PG&E switchyard, the generated power will be transmitted to the existing PG&E power grid through two double-circuit 230 kV lines approximately 2,600 feet long. These lines will connect to the Pit #1, Pit # 3 transmission lines and to the Pit # 1 - Cottonwood transmission lines north of the project. (Ex. 7, p. 2; Ex. 56, p. 44.) The TMPP site was chosen, in part, because of its proximity to these transmission lines. (Ex. 1, § 5.1.1.1; Ex. 56, p. 50.)

Those two lines and the new PG&E switchyard will be built to PG&E standards and owned and operated by PG&E. The project's switchyard will be built, owned, and operated by Applicant. To transmit the generated power safely, PG&E will need to reconductor a total of 88 miles of specific segments (consisting of 60 linear miles) within its two existing 230 kV transmission lines running from Burney to the Cottonwood Substation, via Round Mountain. (Ex. 1, § 2.2.4.2; Ex. 8, p. 1; Ex. 56, p. 44.) Such reconductoring will be done within existing rights-of-way without tower replacements. It will be done according to existing PG&E design

guidelines and construction practices reflecting compliance with applicable laws ordinances regulations and standards (LORS). The purpose of this analysis is to assess the proposed construction and operation of the project-specific and PGE-operated segments for appropriate incorporation of the design measures necessary for compliance with applicable LORS. (Ex. 56, p. 44.) Although Applicant asserts its point of interconnection to the grid is at the proposed on-site PG&E substation (Ex. 1, § 6.18.1), both the project-specific and the PG&E-operated sections (including reconductoring) will be considered one project in assessing the line-related impacts of the proposed project.

Staff's analysis focused on the following issues:

- Aviation safety;
- Interference with radio-frequency communication;
- Audible noise;
- Fire hazards;
- Hazardous shocks;
- Nuisance shocks; and
- Electric and magnetic field (EMF) exposure. (Ex. 56, p. 44.)

2. Potential Impacts

a. *Electric and Magnetic Field Exposure*

The possibility of health effects from exposure to electric and magnetic fields (EMF) has increased public fears about living near high-voltage lines. (Ex. 56, p. 515.) The available data evaluated by the California Public Utilities Commission (CPUC) and other regulatory agencies do not definitively establish that EMF poses a significant health risk nor prove the absence of health hazards.¹⁴ (Ex. 1, § 6.1.2.5; Ex. 56, p. 48.) In light of the present uncertainty regarding EMF exposure, Staff testified that most of the regulatory agencies, including the CPUC, have implemented policies to ensure that transmission lines are designed to minimize EMF without impacting transmission efficiency. (Ex. 56, p. 49.)

¹⁴ Although several states regulate EMF levels for new transmission lines, California has not specified a maximum EMF limit. (Ex. 1, § 6.9.2.5.)

Under CPUC policy, the regulated utilities have established EMF-reducing design criteria for new and upgraded electrical facilities. New transmission lines are not permitted to create EMF levels greater than that of existing transmission lines. (Ex. 56, pp. 49-50.)

Applicant's testimony confirmed that EMF from its proposed transmission line is not significantly different from the existing lines in the immediate vicinity. (Ex. 1, § 6.18.4.1; Ex. 8, p. 3; Ex. 56, p. 53.) Since each new line in California is currently required to be designed according to the EMF-reducing guidelines of the utility in the service area involved, their fields are required under existing CPUC policies to be similar to fields from similar lines in that service area. (Ex. 56, p. 50.) Condition of Certification **TLSN-1** is adopted to ensure implementation of the necessary measures. This is consistent with existing CPUC policy.¹⁵ (*Ibid.*) Condition **TLSN-3** requires Applicant to measure the strengths of the electric and magnetic fields along the transmission line route before and after energization. Since the proposed line designs are in keeping with Cal-ISO's field-reducing guidelines, any exposures within the right-of-way would be similar to those expected from typical Cal-ISO designs. For the proposed and other high-voltage lines, the edge of the right-of-way would mark the beginning of the long-term residential exposures at the root of the present health concern. Since there are no residences or occupied buildings in the vicinity of the proposed lines, no such long-term exposures would be expected. (Ex. 56, p. 519.) Condition of Certification **TLSN-3** is adopted to verify that the fields are reduced within, and outside the edges of the rights-of-way to the extent expected from the use of PG&E's EMF-reducing designs as proposed.

b. Aviation Safety

¹⁵ The CPUC has determined that only no-cost or low-cost EMF-reducing measures for new or upgraded transmission facilities are presently justified in any effort to reduce EMF fields beyond existing levels. (CPUC Decision No. 93-11-013.) (See Ex. 56, p. 49-50.)

The project is proposed for a location with no nearby airports. (Ex. 1, § 6.18.2.) An FAA “Notice of Construction or Alteration” will not be required for the proposed power line, according to existing regulatory criteria. (Ex. 56, p. 51.) Applicant and Staff agree that, in considering all issues related to distance from the line and FAA safety requirements, the proposed line will not pose a significant hazard to area aviation. (Ex. 8, p. 3; Ex. 56, p. 516.)

c. Interference With Radio-Frequency Communication

Corona-related communications interference is most commonly caused by irregularities (such as nicks and scrapes on the conductor surface), sharp edges on suspension hardware and other irregularities around the conductor surface. The intended use of a low-corona conductor design and construction methods (Ex. 1, § 6.18.3.1-6.18.3.2.3) should minimize the potential for such interference which is usually of concern only for lines of 345 kV and above. As noted by Staff for this type of line, no significant communications interference is expected. This is the same as with the existing 230 kV line to which the proposed line will be connected. The related FCC regulations are important in requiring each project owner to ensure mitigation of any such interference to the satisfaction of the affected individual. We adopt condition of certification **TLSN-2** to ensure mitigation of any interference-related complaints on a case-specific basis, as required by the FCC. **TLSN-1** is also adopted to ensure compliance with CPUC GO-52, also intended to prevent radio interference. (Ex. 56, p. 52.)

d. Audible Noise

As with radio noise, the line’s low-corona design will minimize the potential for corona-related audible noise. This means, as noted by the applicant (Ex. 1, § 6.18.3.1), that the line will not add significantly to existing background noise levels in the area. (Ex. 56, p. 52.) For an assessment of the noise from all

phases of the proposed power plant and related facilities, see the **Noise** section in this Decision.

e. Fire Hazards

Operation of the transmission line represents a low fire risk. Fires could occur by sparks from overhead conductors coming into contact with combustible material. As is current Cal-ISO policy, adequate fire prevention and suppression measures will be implemented in the area around the proposed line as required by related regulations and industry practices. Compliance with GO-95 requirements will ensure the clearance necessary to prevent fires from direct contact between the proposed line, trees and other objects (Ex. 56, p. 52.) Condition **TLSN-4** ensures that the transmission line right-of-way will be kept free of combustible material.

f. Nuisance and Hazardous Shocks

Nuisance or hazardous shocks can result from direct or indirect contact with an energized line or metal objects located near the line. The proposed line will be constructed (as is present Cal-ISO practice) according to the requirements of GO-95 which prevent hazardous shocks from direct or indirect human contact with an overhead, energized line. Therefore, staff does not expect these lines to pose any such hazards to humans. (Ex. 56, p. 48.) Condition **TLSN-1** ensures compliance with applicable LORS that require implementation of the mitigation measures proposed by Applicant. As with current Cal-ISO practice, the potential for nuisance shocks will be minimized in the line areas through standard grounding procedures. Ensuring GO-95-required ground clearance as intended will minimize the potential for the electrical charging for which such grounding would be necessary. (Ex. 56, pp. 52-53.) Condition **TLSN-5** will ensure the necessary grounding.

COMMISSION DISCUSSION

The evidentiary record establishes that TMPP's transmission line design will conform with all established requirements to ensure aviation safety, prevent radio and television interference, limit audible noise, eliminate fire hazards, and prevent hazardous and nuisance shocks. Since adverse health effects from electric and magnetic fields (EMF) have not been established or ruled out, the public health significance of project-related field exposure cannot be characterized with certainty. The estimated exposures from the project transmission line are significantly below field levels associated with lines of the same voltage, current-carrying capacity, and field levels established by states with regulatory limits for such fields. There is no evidence that the line will pose a danger from EMF exposure.

FINDINGS AND CONCLUSIONS

Based on the uncontroverted evidence of record, the Commission makes the following findings:

1. The project transmission line consists of a 1300-foot single-circuit 230 kV line from the TMPP switchyard to a new 230 kV PG&E switchyard on the northeast corner of the project site. From the new PG&E switchyard, the generated power will be transmitted to the existing PG&E power grid through two double-circuit 230 kV lines approximately 2,600 feet long. These lines will connect to the Pit #1, Pit # 3 transmission lines and to the Pit # 1, Cottonwood transmission lines north of the project transmission system. These lines are hereinafter referred to as the "project-related lines."
2. The possibility of health effects from exposure to electric and magnetic fields (EMF) has increased public fears about living near high-voltage lines.

3. Neither the California Public Utilities Commission nor any other regulatory agency in California has established limits on public exposure to electric and magnetic fields from power lines.
4. TMPP's transmission line will be designed in accordance with the electric and magnetic field reducing guidelines applicable to PG&E's transmission service area.
5. The estimated EMF exposures from the transmission line are below field levels associated with similar lines in the PG&E service area, and significantly below field levels established by states with regulatory limits for such fields.
6. The Conditions of Certification reasonably ensure that the transmission line will not have significant adverse environmental impacts on public health and safety nor cause impacts in the areas of aviation safety, radio/TV communication interference, audible noise, fire hazards, nuisance or hazardous shocks, or electric and magnetic field exposure.

The Commission, therefore, concludes that with implementation of the Conditions of Certification, the project will conform with all applicable laws, ordinances, regulations, and standards relating to transmission line safety and nuisance as identified in the pertinent portions of **APPENDIX A** of this Decision.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the project-specific 1,300-foot connection to the proposed PG&E switchyard according to the requirements of CPUC's GO-95, GO-52, Title 8, Section 2700 et seq. of the California Code of Regulations and PG&E's EMF-reduction guidelines arising from CPUC Decision 93-11-013. The project owner shall ensure that the 2,600-foot interconnecting lines from the new PG&E Switchyard to the PG&E power grid are constructed according to the same requirements.

Verification: Thirty days before starting construction of the project-specific line to the PG&E switchyard, the project owner shall submit to the Commission's Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the line will be constructed according to the requirements GO-95, GO 52, Title 8, Section 2700 et seq. of the California Code of Regulations and PG&E's EMF-reduction guidelines arising from CPUC Decision 93-11-013. Thirty days before the starting construction of the interconnecting line from the PG&E switchyard to the PG&E power grid, the

project owner shall provide verification of agreement with PG&E regarding PG&E's construction and operation of this line according to the same requirements.

TLSN-2 The project owner shall ensure that every reasonable effort will be made to identify and correct, on a case-specific basis, any complaints of interference with radio or television signals from operation of the project-related lines and associated switchyards. In addition to any transmission repairs, the relevant corrective actions should include, but shall not be limited to, adjusting or modifying receivers, repairing, replacing or adding antennas, signal amplifiers, filters, or lead-in cables.

The project owner shall maintain written records for a period of five years, of all complaints of radio or television interference attributable to operation together with the corrective action taken in response to each complaint. All complaints shall be recorded to include notations on the corrective action taken. Complaints not leading to a specific action, or for which there was no resolution should be noted and explained. The record shall be signed by the project owner and also the complainant, if possible, to indicate concurrence with the corrective action or agreement, with the justification for a lack of action.

Verification: All reports of line-related complaints shall be summarized for the project-related lines and included during the first five years of plant operation in the Annual Compliance Report.

TLSN-3 The project owner shall engage a qualified consultant to measure the strengths of the line electric and magnetic fields from the project-related lines before and after they are energized. Measurements should be made at the same points along the route for which field strength values were presented by the applicant.

Verification: The project owner shall file copies of the pre- and post-energization measurements with the CPM within 60 days after completion of the measurements.

TLSN-4 The project owner shall ensure that the right-of-way of the project-related lines are kept free of combustible material, as required under the provisions of Section 4292 of the Public Resources Code and Section 1250 of Title 14 of the California Code of Regulations.

Verification: During the first five years of plant operation, the project owner shall provide a summary of inspection results and any fire prevention activities carried out along the right-of-way and provide such summaries in the Annual Compliance Report.

TLSN-5 The project owner shall ensure that all permanent metallic objects within the right-of-way of the project-related lines are grounded regardless of

ownership. Such objects shall include fences, gates, and other large objects. These objects shall be grounded according to procedures specified in the National Electrical Safety Code.

In the event of a refusal by any property owner to permit such grounding, the project owner shall so notify the CPM. Such notification shall include, when possible, the owner's written objection. Upon receipt of such notice, the CPM may waive the requirement for grounding the object involved.

Verification: At least 30 days before the line is energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

VI. PUBLIC HEALTH AND SAFETY ASSESSMENT

Operation of the Three Mountain Power Project will create combustion products and utilize certain hazardous materials that could expose the general public and workers at the facility to potential health effects. The following sections describe the regulatory programs, standards, protocols, and analyses that address these issues.

A. AIR QUALITY

This section examines the potential adverse impacts of criteria air pollutant emissions resulting from project construction and operation. The Commission must find that the project complies with all applicable laws, ordinances, regulations, and standards related to air quality. National ambient air quality standards (NAAQS) have been established for six air contaminants identified as “criteria air pollutants.” These are nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), ozone (O₃), lead (Pb), and particulate matter less than 10 microns in diameter (PM₁₀). California’s ambient air quality standards (CAAQS) for these pollutants are generally more stringent than the national standards. (Ex. 1, § 6.8.1.3.1; Ex. 64, pp. 19, 21.) Also included are the precursors for O₃ (nitrogen oxides [NO_x] and volatile organic compounds [VOC and the precursors for PM₁₀: NO_x, VOC, and sulfates [SO_x].) (Ex. 64, p. 19.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

The California Air Resources Board (ARB) is the state regulatory agency with authority to enforce regulations to achieve and maintain the NAAQS and CAAQS. The ARB is responsible for the development, adoption, and enforcement of the state’s motor vehicle emissions program, as well as the adoption, of CAAQS. The ARB also reviews the operations and programs of the local air pollution control districts or air quality management districts. The ARB

requires each district to develop its own strategy for achieving the NAAQS and CAAQS and maintains regulatory authority over these strategies. These districts have primary responsibility for permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations. The Shasta County Air Quality Management District (SCAQMD) is the local agency for the administration and enforcement of air quality regulations for Shasta County. (Ex. 1, § 6.8.1.3.1.)

The Federal Clean Air Act¹⁶ requires new major stationary sources of air pollution to comply with federal New Source Review (NSR) requirements in order to obtain permits to operate. The U.S. Environmental Protection Agency (USEPA), which administers the Clean Air Act, has designated all areas of the United States as attainment (air quality better than the NAAQS) or non-attainment (worse than the NAAQS) for criteria air pollutants. In general, an area is designated as attainment for a specific pollutant if the concentrations of that air contaminant do not exceed the standard. Likewise, an area is designated as non-attainment for an air contaminant if that standard is violated. Where not enough ambient data are available to support designation as either attainment or non-attainment, the area can be designated as unclassified. Unclassified areas are normally treated the same as attainment areas for regulatory purposes. An area can be attainment for one air contaminant while non-attainment for another, or attainment for the federal standard and non-attainment for the state standard for the same contaminant. The entire area within the boundaries of a district is usually evaluated to determine the district's attainment status. (Ex. 64, pp. 21-22.) TMPP is subject to the SCAQMD NSR requirements for some of the pollutants, as well as federal Prevention of Significant Deterioration (PSD) review. In general, under the PSD program, the project must comply with Best Available Control Technology (BACT) for PM₁₀, NO₂, SO₂ and CO and demonstrate that its emission impacts will not significantly degrade the existing ambient air quality in the region. The USEPA has delegated the authority to administer the PSD

¹⁶ Title 42, United States Code section 7401 et seq.

program to SCAQMD. (Ex. 64, p. 19.) **Air Quality Table 1**, below, replicated from Exhibit 64, p. 23, compares state and federal ambient air quality standards.

AIR QUALITY Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	Federal Standards	
			Primary	Secondary
Ozone(O ₃)	1-hour	0.09 ppm (180 µg/m ³)	0.12 ppm (235 µg/m ³)	same as primary
Particulate Matter (PM ₁₀)	Ann.Geo. Mean	30 µg/m ³	---	same as primary
	24-hour	50 µg/m ³	150 µg/m ³	
	Ann.Arit. Mean	---	50 µg/m ³	
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)	None
	8-hour	9 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)	
Nitrogen Dioxide (NO ₂)	1-hour	0.25 ppm (470 µg/m ³)	---	same as primary
	Ann.AritMean	---	0.053 ppm (100 µg/m ³)	
Lead(Pb)	30-day	1.5 µg/m ³	---	same as primary
	Cal. Quarter	---	1.5 µg/m ³	
Sulfur Dioxide (SO ₂)	Ann.Arit. Mean	---	0.03 ppm (80 µg/m ³)	---
	24-hour	0.04 ppm (105 µg/m ³)	0.147 ppm (365 µg/m ³)	---
	3-hour	---	---	0.5 ppm (1300 µg/m ³)
	1-hour	0.25 ppm (655 µg/m ³)	---	---
Sulfates	24-hour	25 µg/m ³	No federal standard	
H ₂ S	1-hour	0.03 ppm (42 µg/m ³)	No federal standard	

Source: California Air Resources Board

1. Existing Ambient Air Quality

TMPP is located approximately one mile north of the town of Burney, at an elevation of 3,140 feet above sea level. At this level, the site is above the level of the inversion layer that affects the air quality in the northern Sacramento Valley. During the winter months, the site may experience a local inversion layer that traps the pollutants generated within the Burney Valley.¹⁷ The area is characterized by mild winters and cool summers, with an average of 28 inches of precipitation per year. (Ex. 64, p. 21.) Applicant asserts that air quality in the Burney area is considered good because the area is classified as an attainment or unclassified area for federal air quality standards for all regulated criteria pollutants. (Ex. 1, § 6.8.1.3.1.) The District is located in the Sacramento Valley Air Basin and has the same boundaries as Shasta County. It is currently classified as attainment for the federal ozone, CO and PM₁₀ standards, and unclassified for the federal NO₂ and SO₂ standards. The District is currently designated as attainment for the state NO₂ and SO₂ standards, unclassified for the state CO standard, and non-attainment for the state ozone and PM₁₀ standards. (Ex. 64, p. 22.)

Ambient air quality data for ozone, PM₁₀ and CO were collected at the project site between the period of 1989 through 1993. The monitoring station operated for a five-year period. The data are presented in **Air Quality Table 2**, replicated from Exhibit 64, page 24. After 1993, the station was dismantled and no ambient data have been collected at the site since then. (Ex. 64, p. 22.)

¹⁷ As noted below, the Burney area in general experiences a low inversion layer during the winter months. This low inversion layer traps pollutants, which contributes to violations of the PM₁₀ air quality standard. (Ex. 64, p. 25.)

AIR QUALITY Table 2

Maximum Ambient Air Quality Measurements Recorded at the
Burney Monitoring Station (1989 through 1993)

Pollutant	Averaging Time	1993	1992	1991	1990	1989	Most Restrictive Ambient Air Quality Standard
Ozone (pphm)	1-hr	NA	9	7	8	8	9 (CAAQS)
No. of Violations		NA	0	0	0	0	
PM ₁₀ (µg/m ³)	24-hr	91	86	80	80	91	50 (CAAQS)
	Annual	35	29	29	29	29	30 (CAAQS)
Calculated no. of days of violation		18	36	60	54	54	
NO ₂ ¹ (µg/m ³)	1-hr	NA	94	132	132	NA	470 (CAAQS)
CO(µg/m ³)	8-hr	NA	1150	2300	2620	2875	10000 (CAAQS & NAAQS)
SO ₂ (µg/m ³)	1-hr	NA	NA	NA	NA	NA	655 (CAAQS)
Notes: CAAQS = California Ambient Air Quality Standard NAAQS = National Ambient Air Quality Standard ¹ Data for the 1-hour NO ₂ are from the Redding monitoring station. NA = data not available							

Source: CARB: California Air Quality Data.

CO ambient concentrations recorded, as shown above, did not exceed 2875 µg/m³, which is less than 30 percent of either the state or the federal CO air quality standard.

Staff was unable to obtain any recent ambient NO₂ or SO₂ data for the area. The only available ambient data available are three years of 1-hour NO₂ data (from 1990 to 1992) collected at the Redding monitoring station, which is located in the most populous area of the county where mobile and industrial sources contribute significantly to NO₂ levels. The data indicate that the highest recorded 1-hour NO₂ concentrations were between 132 and 94 µg/m³, which were well below the state standard of 470 µg/m³. Based on the relative lack of major industrial sources and the lack of any significant increase of population in the Burney area, Staff believes it is reasonable to conclude that the NO₂ concentration in Burney would be well below those measured at the Redding monitoring station.

Therefore, Staff argues that the use of Redding ambient NO₂ data is overly conservative. (Ex. 64, p. 22.)

For SO₂, the entire county is classified as attainment for the state and unclassified for the federal standards. Even though local ambient SO₂ concentration data are not available, staff asserts that, in the most conservative sense, the area is comparable with the SO₂ data for the whole Sacramento Valley air basin. This conservative approach is a valid one, again based on the lack of industrial and mobile sources compared to the Redding or Sacramento areas. The highest measured 24-hour SO₂ concentration in the entire basin, measured at the Sacramento Del Paso Manor monitoring station, is 0.018 ppm. This is well below the state and federal 24-hour SO₂ ambient standards of 0.04 and 0.147 ppm, respectively. (Ex. 64, p. 24.)

Ambient Ozone. Ozone is not directly emitted from stationary or mobile sources; rather it is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants. Nitrogen oxides (NO_x) and hydrocarbons (Volatile Organic Compounds [VOCs]) react with oxygen in the presence of sunlight to form ozone. Although the ambient air quality data in **Air Quality Table 2** are sketchy and not up to date, staff asserts that the data are suitable to describe the conditions at the project site. Staff reviewed the Burney area's inventory of stationary sources emissions from 1990 to 1996 (the latest data available from ARB) and found that the Burney area lacks of sufficient industrial sources to produce significant NO₂ and VOC (ozone precursors) emissions. The emission inventory data from 1990 to 1996 are tabulated in **Air Quality Table 3**, below, replicated from Exhibit 64, page 25. These data indicate that the area has not experienced any growth in stationary sources' emissions since 1990. Based on this review, staff asserts that the available data presented in **Air Quality Table 2** adequately represents the current environment of the Burney area. The ambient ozone concentrations recorded between 1989 and 1992, as shown on **Table 2** have ranged from 7 to 9 parts per hundred million (pphm). The area did not experience **any** days of violation of either the state or federal ozone air quality

standards. (Ex. 64, pp. 24-25.)

AIR QUALITY Table 3

1990 through 1996 Burney Area Industrial Stationary Source
Emission Inventory

POLLUTANTS	1990	1993	1995	1996
VOC	74	37	40	57
CO	1975	1680	1280	1580
NO ₂	297	416	582	270
PM ₁₀	200	48	56	67

Source: ARB emission inventory.

Ambient PM₁₀: PM₁₀ is a legitimate source of concern in the Burney area. PM₁₀ can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NO_x, SO_x and VOC from turbines, and ammonia (NH₃) from NO_x control equipment can, given the right meteorological conditions, form particulate matter known as nitrates, sulfates, and organics. These pollutants are known as secondary particulates, because they are not directly emitted but are formed through complex chemical reactions in the atmosphere. Unlike ozone, the Burney area experiences numerous violations of the state PM₁₀ ambient air quality standards. During the period of measurements shown in **Table 2** (1989 through 1993), PM₁₀ violations occurred between the months of November through March, when the weather is cold. The Burney area experiences a low inversion layer during these cold months. This low inversion layer traps the pollutants, which contributes to violations of the PM₁₀ air quality standard. (Ex. 64, p. 25.)

After a review of the industrial emission inventory data, Staff determined that the primary cause of PM₁₀ violations in the winter is not industrial emissions, but rather emissions from residential wood-burning stoves. This is a typical problem in mountain communities with inversion conditions. In 1990, the SCAQMD

adopted a control measure to control the emissions from wood stoves and fireplaces in Shasta County. This control measure requires that all new houses be equipped with clean burning wood stoves, but a provision that older wood stoves be upgraded when a house was sold was deleted. (Ex. 64, pp. 25-26.)

The area has not experienced any significant change in population and has experienced a reduction of emissions from industrial stationary sources. We conclude that the ambient PM₁₀ data collected from 1989 to 1993 are representative of the area's existing conditions. We do, nevertheless, require, as Condition of Certification **AQ-29**, that the Applicant collect five years of ambient ozone and PM₁₀ data. This requirement is in response to concerns raised by the local community about the ambient conditions of the area. This collected data will enhance the understanding of the area's air quality condition and should demonstrate that our determination of ambient air quality herein is accurate and further that the project will not cause any significant unmitigated impact to air quality. The first two years of data collection will be prior to and during the construction of the project, with the remaining three years of data collection to occur after the project commences operation. (Ex. 64, p. 26.) The collected data will be provided to the Commission and to SCAQMD, and will, therefore, become a public record, available to interested persons.

2. Potential Impacts

The SCAQMD'S Final Determination of Compliance (FDOC) and the evidence as a whole indicates that the USEPA, the SCAQMD, and the ARB worked together with the Applicant, Staff and the Intervenors to determine whether project emissions of criteria pollutants would cause significant air quality impacts and to identify appropriate mitigation measures that would reduce potential impacts to levels of insignificance. (See discussion contained in the FDOC, Exhibit 73.) The FDOC concludes that the project will comply with all applicable air quality requirements and imposes certain conditions necessary to ensure compliance.

(Ex. 73.) Pursuant to Commission regulations, the Conditions contained in the FDOC are incorporated into this Decision. (Cal. Code of Regs., tit. 20, §§ 1744.5, 1752.3.) The expert witnesses for SCAQMD, Staff and Applicant agree that, with the incorporation of the conditions set forth in the FDOC and the Air District's draft PSD permit and this Decision, TMPP will comply with all applicable air quality LORS and will not result in any significant direct, indirect or cumulative air quality impacts during construction or operation. (Ex. 64, pp. 46-47; Ex. 73; 12/18 RT 159-160, 166-167.) Two Intervenor, Black Ranch and the Burney Resource Group (BRG), have submitted testimony that disputes this conclusion. (Ex. 76 and Ex. 77.) This decision will examine each disputed issue.

The Commission not only reviews compliance with Air District rules but also evaluates potential air quality impacts according to CEQA requirements. The CEQA Guidelines provide a set of significance criteria to determine whether a project will violate or contribute to an existing air quality violation. (Cal. Code of Regs., tit. 14, § 15000 et seq., Appendix G.) Staff found that TMPP would not violate any local, state, or federal air quality standards nor contribute to significant cumulative impacts. With the requirements adopted herein, all project construction and operating impacts on air quality will be mitigated to a level that is not significant. (Ex. 64, pp. 46-47.) The following discussion provides an overview of the analyses that support the conclusions reached by the Air District and Staff.

Because the project is attainment for all federal standards, no offsets are required under EPA or ARB regulations. (Ex. 1, § 6.8.5.2.) The Shasta County General Plan, Policy AQ2-e, however, requires new projects with stationary sources of emissions of non-attainment pollutants or their precursors that exceed 25 tons per year (TPY) to provide "appropriate emissions offsets." (*Ibid.*; Ex. 64, p. 38.) The applicant, therefore, is required to provide offsets for ozone precursors and for PM₁₀ to address non-attainment of state standards.

Ozone Impacts, Offsets and Mitigation

The offsets (“emission reduction credits” or “ERCs”) for ozone precursors consist in this case of a Purchase Option Agreement¹⁸ to purchase up to 153 TPY of NO_x and up to 65 TPY of VOC emission reduction credits from Sierra Pacific Industries. (Ex. 64, p. 38.) Sierra Pacific Industries banked these offsets for the 1984 shut down of sawmill equipment in Anderson, 40 miles southwest of Burney. (*Ibid.*) Based on SCAQMD’s calculation of annual emissions from the proposed facility and as described in the Detailed Mitigation Plan¹⁹ and a letter to the District indicating the Applicant would forego its opportunity for interpollutant trading, it is necessary to offset a total of 144 tons/year of NO_x emissions and 41 tons/year of VOC emissions if the General Electric gas turbines are used or a total of 130 tons/year of NO_x emissions and 65 tons/year of VOC emissions if the Westinghouse gas turbines are used. (Ex. 73, p. 26.)

The District is attainment for federal ozone standards, so offsets are not required by federal law (Ex. 64, pp. 22, 38), but the offsets are required pursuant to the Shasta County general plan. BRG asserts that these ERCs are “not appropriate” because Anderson is unlikely to contribute to ozone in the Burney area, and that the ERCs in question were not properly banked. (Ex. 77, pp. 19-20.) Neither of these contentions is correct.

Air district rules do not require that a specific offset mitigate a specific pollution source because such “one for one” mitigation would be virtually impossible to establish, given the uncertainties of geography, wind direction, and location. Moreover, ozone problems are regional problems (12/18 RT 193-194, 224), and the impacts of ozone are frequently distant from the source of ozone precursors. As a result, the position of all air districts is to require regional offsets to attenuate a regional problem.

¹⁸ A redacted copy of this agreement is attached as Exhibit 9 to Ex. 66, Testimony on Air Quality.

¹⁹ The Detailed Mitigation Plan, dated August 19, 2000, is attached as Ex. 3 to Ex. 66, Project Description Testimony.

In this case, the region that is non-attainment for the state ozone standard is Shasta County or the District (the two have the same boundaries). Although Burney is within the boundaries of Shasta County, the previous monitoring in Burney indicated no exceedances of the state standard in the Burney basin itself. (12/18 RT 194; see also Table 2, above) Temperatures are higher in the lower (in elevation) Central Valley and ozone is consequently more of a problem there than in Burney. (12/18 RT 226.) The violations were found and measured in Redding. (Ex. 1, § 6.8.1.3.2.) Burney does not have an ozone problem (12/18 RT 199-200.) but under this regional procedure, projects built in the Burney basin must be offset because they are within the affected region. Offsets purchased where violations actually occur, such as those in Anderson, are more effective at mitigating the overall ozone problem in the region than offsets purchased in Burney, where ozone is not an apparent problem. (See 12/18 RT 200.) The ERCs from the Sierra Pacific facility in Anderson are appropriate emission offsets for the Project. (Ex. 64, pp. 44, 46; Ex. 69, Rebuttal Air Quality Testimony, p. 22; Ex. 73, p. 26.) These offsets are real, permanent, quantifiable, surplus and enforceable in compliance with the Shasta County General Plan. (Ex. 64, pp. 38-39, 44; Ex. 69, Rebuttal Air Quality Testimony, p. 22; Ex. 73, Response to Comments, p. 20.)

BRG also contends that the Sierra Pacific ERCs were improperly “banked” because the reduction was created prior to the District ERC certificate system. (Ex. 77, pp. 19-20.) According to Mr. Kussow, however, the District banking rule specifically allowed the banking of emission reductions that occurred prior to adoption of the banking system, including the one’s in question here. (12/18 RT 193.) BRG did not offer any evidence to the contrary but relied on previous statements of Dr. Fox, who was not a witness at these hearings. Her comments, in fact, were on behalf of CURE and were made as objections to the SCAQMD during the comment period on the Draft Authority to Construct/Prevention of Significant Deterioration Permit proceedings. The District’s responses were

substantially the same as our determinations here. For the District's discussion of those objections, see Exhibit 24 to Exhibit 66, Testimony on Air Quality, which discussion was not mentioned by BRG.

Intervenor Black Ranch, through its witness Dr. Erbes, also asserts that TMPP should obtain local VOC offsets through the wood stove replacement program (further discussed below). (Ex. 76, pp. 1-2.) This assertion is similar to BRG's "one on one" contention discussed above and our response is the same. Local offsets are not required and often are not even desired from a regional standpoint. In fact, TMPP proposed to do as now requested by Black Ranch and offset some or all of its VOC emissions through a wood stove replacement program. As an independent party, Staff objected to that proposal. (Ex. 69, Rebuttal Air Quality Testimony, p. 2.) In response to Staff's objection, TMPP agreed to offset all its VOC emissions with ERCs from the Sierra Pacific Facility in Anderson. The Air District has required VOC offsets as mandated by the Shasta County General Plan. (*Id.*) The SCAQMD, Staff and TMPP concur that no further offsets are required. (Ex. 67, p. 7, Ex. 69, Rebuttal Air Quality Testimony, p. 2.) Even though TMPP will receive no credit for VOC reduction via the wood stove replacement program, the program will produce reductions in VOC emissions in the Burney area. (Ex. 69, Rebuttal Air Quality Testimony, p. 2.) Dr. Erbes acknowledges that Staff and TMPP have developed "creative and effective emission reduction programs in order to help mitigate the potential air quality impact of the proposed project" but he presents no sound evidence that his wood stove program is a better alternative. (Ex. 76, p. 2.)

Black Ranch is also not satisfied with proposed language surrounding the 5 percent discount rate for ERCs. (Ex. 76, p. 2.) The 5 percent net air quality benefit is a requirement of SCAQMD Rule 2.2 (Emission Reduction Credit and Banking Rule), Section H. This section requires the District reduce the purchased ERCs by 5 percent before the emission reduction credits are approved. The contract between TMPP and Sierra Pacific Industries requires

TMPP to redeem 105 percent of the emissions needed to offset all of the Project's emissions. (Ex. 69, Rebuttal Air Quality Testimony, pp. 2-3.) The applicant has purchased banked emission reduction credits and, therefore, the 5 percent adjustment has been made by SCAQMD. No further action is required by this Commission. (Ex. 67, Staff Rebuttal To The Testimony Of Black Ranch, p. 2.)

PM₁₀ Impacts Offsets and Mitigation

As noted above, the applicant is required to provide offsets for PM₁₀ to address non-attainment of state standards. Based on SCAQMD's calculation of annual emissions from the proposed facility and as described in the Detailed Mitigation Plan²⁰ and a letter to the District indicating the Applicant would forego its opportunity for interpollutant trading, it is necessary to offset a total of 184 tons of PM₁₀ (the PM₁₀ amount includes direct PM₁₀ emissions from the turbines, the cooling tower PM₁₀ emissions, and the turbine SO_x emissions, a precursor of PM₁₀) if the General Electric gas turbines are used or a total of 154 tons/year of these emissions if the Westinghouse gas turbines are used. (Ex. 73, p. 26.)

Seventy-five percent of the offsets for PM₁₀ will be provided by the paving of several roads.²¹ The pool of roads consists of three county roads and several private roads near Burney.²² (Ex. 64, pp. 38-39, as modified by Errata in Ex. 67.) Sufficient paving will be done to reduce dust PM₁₀ by 75 percent of the projects PM₁₀ emissions, which depends upon the turbine selected (as discussed above). (*Ibid.*) See Condition **AQ-21**.

²⁰ The Detailed Mitigation Plan, dated August 19, 2000, is attached as Exhibit 3 to Ex. 66, Project Description Testimony.

²¹ As noted in the PSD/ATC (Ex. 73, pp. 5-6 of 17), 75% of the offsets will come from road paving and the remaining 25% from the fireplace retrofit/stove replacement program as discussed herein.

²² The Applicant has identified Goose Valley, Tamarack and Mountain View county roads and Cottonwood, Fairfield, Vallejo, Estes, Ivan Marx, Washburn, Pit River Casino Parking Lot, Bailey, Apple Orchard, and Goose Creek private roads that can be paved. Paving of all of them would greatly exceed the necessary mitigation. Not all will be paved. (Ex. 64, pp. 38-39, as modified by Errata in Ex. 67.)

The remaining 25 percent of offsets will be in acquired through the staff proposed mitigation to address the most serious air quality problem in Burney - wood smoke PM₁₀ during winter months. This mitigation requires the applicant to fund EPA-certified, low-emission wood stoves to replace those of persons using older, uncertified stoves in Burney. (*Id.*, at p. 41.) This voluntary program will replace either 389 or 465 older stoves, depending on which turbine the project uses.²³ The wood stove program will be on a “first come, first serve” basis and will last for five years, during which time any resident may replace/retrofit an older (operating) stove or fireplace and receive an EPA-certified Phase II stove or fireplace costing up to \$1225, including the appliance and installation. (Ex. 64, p. 42.) A participant can choose a more expensive stove, but must pay the additional cost. (*Ibid.*) Any funds remaining in the program after five years will be devoted to additional road paving. (*Ibid.*) See Condition **AQ-22**.

The collective mitigation proposed by staff and accepted by the applicant will compensate for the PM₁₀ emissions from the project. Wood smoke emissions are a major PM₁₀ source and such emissions occur at the ground level, where inhalation is most likely. (Ex. 72, p. 3.) Road dust is also a ground level source. The paving and wood stove program should thus result in genuine improvements in Burney air quality that offset the PM₁₀ emissions from the stack of the project. (*Ibid.*)

BRG makes the point that failure to use the SCONox emissions control technology (discussed further below) means that the project must use ammonia in its catalysts and that this will result in ammonia emissions, that will in turn create significant additional PM₁₀. (Ex. 77. pp. 3-4.) The parties have argued at length in their briefs about the amount of ammonia slip, but no party correctly analyzes the testimony presented by the other parties in this case.

²³ As discussed previously, the different turbines have different PM₁₀ emissions, and hence justify different levels of emissions reductions.

The BRG testimony overestimates the amount of ammonia slip, estimating 600 pounds per day. (Ex. 77, pp. 3-4.) This overestimation, however, is partly the result of incorrect *Staff* testimony. BRG computes the 600 pounds per day as follows. The Applicant has committed to an ammonia slip *no greater* than 5 ppm,²⁴ that at the time of commitment was the *lowest* ammonia slip level being permitted throughout California. In Exhibit 66, *Staff* **incorrectly** computed that 5 ppm would result in approximately 1,200 pounds of ammonia emitted into the atmosphere on a daily basis.²⁵ BRG testimony then asserts that the “average concentration of ammonia in the stack gases over the life of an SCR catalyst is one-half or more of the guaranteed slip of 5 ppm.”²⁶ (Ex. 77, pp. 3-4.) BRG goes on to assert that “it is likely that the plant will have a 2 ppm ammonia slip initially followed by 3 ppm in the second year and 3-4 ppm in the third year. They translate this into the statement that at the “rate of fifty-percent slip over the project life, daily emissions would equal one-half of the (staff) estimated 1200 lbs./day, or 600 lbs./day.” (*Ibid.*)

The fatal flaw is that the assertion is premised on erroneous data, to wit, the improper calculation by Staff. Even if we assume, *arguendo*, that the 50 percent figure is supportable, 50 percent of 600 lbs./day is only 300 lbs./day.

600 lbs./day would be the emission rate if the facility were operating constantly at the very maximum ammonia slip limitation of 5 ppm for the entire day. (12/18 RT 210-211.) Staff testimony was that the project is not expected to operate at anything close to the permitted limit. The Staff testimony was based on emissions from existing plants in California. The Staff expert, Mr. Ngo, testified in

²⁴ This commitment was made as a part of Applicant’s Joint Mitigation proposal with CURE in July 2000. The Proposal is attached as Ex. 2 to Ex. 66 Project Description Testimony. The 5 ppm rate was subsequently made a part of the FDOC and the ATC/PSD permit issued by SCAQMD.

²⁵ The Staff witness admitted during cross-examination that he made a “boo-boo” in putting the 1200 pound figure in the FSA (Ex. 64) and repeating it in his Rebuttal Testimony (Ex. 67). He testified that the correct figure should have been 600 pounds per day computed at the full and constant 5 ppm ammonia slip rate. (12/18 RT 210-212.)

his direct and rebuttal testimony that he expects the actual emissions will be no more than 150 lbs./day or less than 1 ppm. (Ex. 64, p. 31; Ex. 67, Rebuttal to the Testimony of the BRG, p. 1.) Attached to his Rebuttal Testimony was a report on a similar turbine installed in Vancouver, Washington (River Road Plant). Test results at River Road, over a three year period, were in the range of 0.01 to 0.2 ppm. These percentages are drastically less than those estimated by Mr. Ngo and by the BRG witnesses, as shown by the chart below. Mr. Ngo testified that TMPP results should be comparable to those achieved at River Road²⁷. (Ex. 67, Rebuttal to the Testimony of the BRG, p. 2.)

SOURCE	ESTIMATE/RESULTS	PERCENTAGE OF PERMITTED LEVEL
Permitted Level	5 ppm	100%
BRG Witnesses	2.5 ppm	50%
Staff Witness	1 ppm	20%
River Road Plant	0.01 to 0.2 ppm	0.2% to 4%

BRG points out in its Rebuttal Brief that the figures from the River Road Plant may not be comparable for several reasons. We will assume, without deciding, that those results should not be expected from TMPP. We do, nevertheless, find that the results of 1 ppm can and should be achieved as explained by Mr. Ngo.

It is also a fair implication that the BRG testimony assumed that 100 percent of the ammonia emissions will be converted to PM₁₀. (Ex. 77, pp. 3-5.) During cross-examination, BRG's witness, Greg Gilbert, was unsure whether the estimated conversion had assumed 100 percent conversion, because he had

²⁶ BRG witnesses cite a "presentation" made by Tim Shippy, Peerless, to the ARB in July 1999 as authority for this proposition. No further support is listed.

²⁷ During cross-examination, Mr. Ngo testified that he was 80% sure these levels could be achieved. He could not be completely sure because the design of the facility was not yet finalized. He had recommended conditions to verify an appropriate design, which would remove the 20% doubt.

merely adopted the numbers from CURE's witness²⁸ in another proceeding, but he believed the assumed conversion to be 100 percent. (12/18 RT 256.) He admitted that actual conversion is difficult to calculate, that he was aware of no studies supporting a 100 percent conversion rate, that 100 percent conversion was assumed as a "worst case", and that the assumption was "to get your attention." (12/18 RT 256-258.) This response to cross-examination reflects poorly on his credibility.²⁹

In contrast, staff testified that conversion of ammonia slip to PM₁₀ would be minimal because of the lack of free hydroxide radicals and nitric acid (necessary elements for such conversion) in the area ambient air. (Ex. 64, p. 35.) Staff estimated that the conversion rate will be "not even close to 10 percent in the Burney area" because of lack of ozone and NH₃. (*Ibid.*) By contrast, 10 to 30 percent conversion rate might be expected in a polluted urban area. (*Ibid.*) The District testified in accord that the ambient air in this vicinity is low in nitric acid. (12/18 RT 164.) Staff's conclusion was that the secondary PM₁₀ from ammonia slip and other sources would be minimal. (Ex. 64, pp. 35-36.) We accept the validity of this testimony.

Methodology. Air dispersion models provide a means of predicting the location and magnitude of the air contaminant impacts of a new emissions source at ground level. These models consist of several complex series of mathematical equations, which are repeatedly calculated by a computer for many ambient conditions. The model results are often described as a unit of mass per volume of air, such as micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). They are an estimate of the concentration of the pollutant emitted by the project that will occur at ground level. The applicant has used an EPA-approved ISCST3 model to estimate the

²⁸ That witness, Dr. Fox, did not testify in this proceeding. BRG attached her testimony if a prior proceeding to their testimony here. It is given little weight here as she was not subject to cross-examination nor was it specific to this proceeding.

²⁹ The other sponsors of BRG's testimony did not appear for cross-examination. Mr. Gilbert testified that he "helped" to prepare the testimony and that he performed about 70% of the work on it. (12/18 RT 249-250.)

impacts of the project's NO_x, PM₁₀, CO and SO_x emissions resulting from project construction and operation. Staff added Applicant's modeled impacts to the available highest ambient background concentrations measured during 1989 through 1993 at the Burney monitoring station. Staff then compared the results with the ambient air quality standards to determine whether the project's emission impacts would cause any new violations of the ambient air quality standards or contribute to an existing violation. (Ex. 64, p. 31.)

Inputs for the modeling include stack information (exhaust flow rate, temperature, stack dimensions), specific turbine emission data and meteorological data, such as wind speed, atmospheric conditions, and the site elevation. For this project, the meteorological data used as input for the modeling included the hourly wind speeds and directions measured at the Soldier Mountain monitoring station. It should be noted that the monitoring station name is Soldier Mountain, but it is not physically located on Soldier Mountain. The actual physical location of the monitoring station is at mid-summit of Brush Mountain, located about four miles west of the project site and at an elevation of approximately 3,500 feet³⁰. Because of concerns raised by BRG and others that the meteorological data used in the model were not representative of the local conditions, Staff requested the applicant to perform an additional modeling analysis that incorporated all stack information, the specific turbine emission data, **and a set of artificially severe meteorological data**. This type of modeling analysis results in the **worst possible potential impacts** that the project could cause, but which are not **expected** to occur. The results of this analysis are used to verify whether or not the project will cause a violation, whether or not it will contribute significantly to any existing PM₁₀ violation of the area, and whether or not it will exceed any PSD incremental increase in the ambient air. (Ex. 64, pp. 31-32.)

³⁰ The project is located at an approximate elevation of 3,173 feet. (Ex. 64, p. 31.)

Construction. The results of the project construction impacts are presented in **Air Quality Table 8**, below, replicated from Exhibit 64, p. 33. The modeling analyses included both the fugitive dust and vehicle exhaust emissions, which include PM₁₀, NO₂ and CO. In **Air Quality Table 8**, the first column represents the air contaminant, i.e., NO₂, PM₁₀, and CO. The second column presents the averaging time for each air contaminant. The third column presents the project emission impacts. The fourth column presents the highest measured concentration of the criteria air contaminants in the ambient air (background). The fifth column presents the total impact, i.e., the sum of project emission impact and background measured concentration. As indicated in **Air Quality Table 8**, the project construction activities further exacerbate existing violations of the State 24-hour PM₁₀ standard. Staff's review of the modeling results indicates that the project's construction impacts are not expected to be occasional or isolated events, but they will occur only within the project's boundaries, where the general public does not have access. (Ex. 64, p. 32.)

The predicted impacts are high for a number of reasons. First, the model itself calculates impacts that are very conservative, usually exceeding actual impact levels by a considerable margin. Second, the analysis assumes that all the NO_x emitted from the vehicles is in the form of NO₂. In reality, approximately 90 percent of NO_x emissions from a combustion source are in the form of nitrogen oxide (NO), which eventually would oxidize to NO₂ as it disperses in the atmosphere. Therefore, the one-hour NO₂ impact shown in the modeling analysis does not realistically reflect the possible one-hour NO₂ impact. Third, some of the sources of combustion emissions (bulldozers and trucks) are mobile sources, not stationary sources. Therefore, as mobile sources, the air quality impacts would not always be at the same locations, so the modeling results are overstated. Fourth, it was assumed that all the equipment identified for the modeling evaluation would be running simultaneously. It is doubtful that all the major equipment, 4 large bulldozers, 4 backhoes, 12 cranes and 5 large flatbed trucks, would all be operating at one time, and thus the impacts are overstated.

Finally, the emissions inputs to the model were from the highest monthly emissions assumed during the 20-month construction period. The levels of emissions used reflect a period of activity of approximately one year, not the entire construction period. During the other months of construction work, considerably less emission generating equipment will be used and thus the impacts will be even lower. (Ex. 64, p. 32.)

AIR QUALITY Table 8
Facility Construction Impacts

Pollutants	Avg. Period	Impacts ($\mu\text{g}/\text{m}^3$)	Background ($\mu\text{g}/\text{m}^3$)	Total Impacts ($\mu\text{g}/\text{m}^3$)	Standards ($\mu\text{g}/\text{m}^3$)	Percent of Standard
NO ₂ ¹	1-hr.	330	130	460	470	99%
CO	8-hr.	1,870	2870	4,740	10,000	47%
PM ₁₀	24-hr.	201	91	292	50	584%

Notes: 1. NO₂ emission impact was estimated using ozone limiting method.
Source: Ex. 1, p. 33.

Construction of the TMPP will result in unavoidable short-term PM₁₀ impacts. Because the area is non-attainment for PM₁₀, additional impacts during construction of the project can be viewed as significant. However, it is doubtful that the general public would be exposed to the construction impacts associated with the project. This is because the highest PM₁₀ impacts are registered within the property fence line and drop off to about 26 $\mu\text{g}/\text{m}^3$ at the nearest residential area of Johnson Park. Nevertheless, the impacts from the construction of the project will be further reduced with the implementation of the Staff recommended construction mitigation measures, as discussed in the Mitigation section. (Ex. 64, p. 33.)

Commissioning: The initial commissioning refers to a period of approximately 60 days prior to beginning commercial operation when the combustion turbines will undergo initial test firing. During this commissioning phase, the project may operate at a low load for a long period of time for fine-tuning. SCAQMD has

required that each activity of the commissioning period be planned carefully, and that all NO_x and CO emissions and the time of commissioning be optimized to lessen the excess emissions from the turbines, duct burners and HRSG. It should also be noted that the NO_x and CO emissions during the commissioning period are not higher than those happen during normal start up of the facility. Therefore, there will be no additional impacts as a direct result of the emissions during the commissioning period. In addition, all criteria air contaminant emissions during the commissioning period will be counted toward the annual emission limits. Thus there is an incentive for the applicant to limit the commissioning period to the shortest time possible. Commissioning ends with the start of commercial operation, which requires a Permit to Operate from SCAQMD. To ensure that no significant air quality impacts occur during the initial commissioning phase of the Project, we adopt a set of conditions specifically for this period. These measures are included in **AQ-C3** through **AQ-C10**). (Ex. 64, p. 30.)

Commercial Operation: Applicant provided Staff with a modeling analysis of the project's operating emissions impacts from directly emitted pollutants. Applicant asserts that this analysis demonstrates that no violations of ambient air quality standards will be caused by the operation of the project. Staff reviewed the modeling analysis and concluded that it was adequate. **Air Quality Table 9**, replicated from Exhibit 64, p. 34, presents the results of the modeling analysis **using worst case hourly emissions**, including turbine start-up and cooling tower emissions. **Air Quality Table 9** shows that, with the exception of PM₁₀, the project does not cause any new violations of any applicable air quality standard. For PM₁₀, Staff determined that the project itself does not cause any violation of either the 24-hour or the annual PM₁₀ air quality standards. However, the project's impacts **will** contribute to the PM₁₀ violations in the area that regularly occur during the cold months of the year, when wood stoves and fireplaces are commonly being used. Therefore, the project's PM₁₀ emission impacts are significant. To mitigate these impacts, Staff recommended the project PM₁₀

emissions be offset by emission reductions in the local area. (See the adopted mitigation measures in the Mitigation section of this analysis.) (Ex. 64, p. 33.)

AIR QUALITY Table 9

Worst Case Facility Emission Impacts on Ambient Air Quality

Pollutants	Avg. Period	Impacts ($\mu\text{g}/\text{m}^3$)	Background ($\mu\text{g}/\text{m}^3$)	Total Impacts ($\mu\text{g}/\text{m}^3$)	Standard ($\mu\text{g}/\text{m}^3$)	Percent of Standard
NO ₂	1-hour	224	132 ¹	358	470	76%
	Annual	1	22	23	100	23%
SO ₂	1-hour	2	n/a	n/a	655	n/a
	24-hour	1	n/a	n/a	n/a	n/a
CO	1-hour	1,000	4,570	5,570	23,000	24%
	8-hour	465	2,860	3,325	10,000	33%
PM ₁₀	24-hour	11	91	102	50	204%
	Annual	2	35	37	30	123%

Note: ¹ The background concentration of NO₂ is from the Redding Monitoring station.

Source: Exhibit 64, p. 34, as modified by Errata sheet in Exhibit 67.

Cumulative Impacts. Staff's cumulative impact assessment, which we adopt, was composed of two types of analysis. The first is an analysis of the project's directly emitted pollutants along with similar emissions from other foreseeable future projects that are currently under construction, or are currently under District review. The second is a discussion of the project's potential contribution to the formation of secondary pollutants, namely ozone and PM₁₀. To evaluate the *direct emission impacts* of the TMPP along with other probable future projects, Staff searched for projects located up to six miles from the proposed facility. Impacts from projects beyond six miles would not effect the modeling analysis on a cumulative basis. Staff reviewed SCAQMD permit files and found that there are *no* major sources currently being built or proposed within the six miles limit of the project site. Therefore, a directly emitted pollutant cumulative impact analysis was not needed or performed by Staff. (Ex. 64, p. 34.) As part of the required PSD analysis, Applicant conducted a cumulative impact analysis.

The cumulative impact analysis demonstrated that the cumulative impacts from the existing major facilities within six miles of the project, plus impacts from the project, would neither cause an exceedance of an ambient air quality standard nor consume the PSD increment. Staff determined that the cumulative impacts were not significant. (*Id.*, Ex. 66, Air Quality Testimony of V. L. Thompson, Attachments 20 and 25.)

The project's gaseous emissions, primarily NO_x and VOC, have the potential to contribute to the formation of ozone in the Sacramento Valley region, if not mitigated. TMPP NO_x and VOC contribution to the regional ozone problem could be considered to be significant, but will be mitigated by the purchase of emission reduction credits of NO_x and VOC to fully offset all emissions from of the TMPP facility. As for the ozone contribution to the Burney area, Staff determined the TMPP NO_x emissions will scavenge ozone in the vicinity of the project, thus reducing ambient ozone concentrations in the Burney area. Such scavenging is an air quality benefit, although it generally affects a smaller area than project's contribution to increased ozone concentrations in the region. Therefore, Staff concluded, as we do, the project contribution to ozone concentration in the Burney area is not significant. (Ex. 64, pp. 34-35.)

The project's NO_x, VOC, NH₃ and SO_x emissions can contribute to the formation of secondary PM₁₀, namely nitrates, sulfates and organic condensable particulate matter. Not all hydrocarbons (VOC) will form secondary PM₁₀. VOC emissions from TMPP will be in the form of unburned natural gas (which is mostly methane and ethane). TMPP is not expected to emit any significant amount of VOC that will participate in the formation of secondary PM₁₀. (Ex. 64, p. 35.)

Staff asserts the project will not have any significant potential to contribute to the ammonium nitrate emissions to the area due to the lack of free hydroxide radicals and nitric acid in the area ambient air. Available research indicates that

the conversion rate of NO_x to nitrate is approximately between 10 percent to 30 percent per hour *in a polluted urban area* where ozone and ammonia are present in sufficient amounts to participate in the reaction. Staff asserts that the NO_x to nitrate conversion rate *in the Burney area* is much less than 10 percent because of the lack of ozone and NH₃. Using a 10 percent NO_x to nitrate conversion rate and a linear extrapolation of the project's PM₁₀ modeling results, Staff estimated the NO_x to nitrate impact from the project at a maximum 0.5 µg/m³, or equivalent to approximately 14 tons per year of direct PM₁₀. This additional secondary PM₁₀, together with the project's direct PM₁₀ emissions will significantly contribute to the PM₁₀ problem in Burney. The total PM₁₀ impact, direct and indirect, will be mitigated by local emission reductions in the area as discussed below. (Ex. 64, p. 35.)

Additionally, the project will contribute to sulfate levels in the area, although in a very small amount. Studies have provided data on the oxidation rates of SO₂, enabling researchers to approximate the conversion of SO₂ to particulate (typically about 0.01% to 1% per hour). Because the project uses natural gas as fuel, very little SO₂ emissions will be emitted; obviating the need for the SO₂ to sulfates conversion. Nevertheless, Staff recommends, and we adopt, offsets in the form of emission reductions in the local area to lessen the project's PM₁₀ contribution to the level of insignificance. (Ex. 64, pp. 35-36.)

3. Mitigation

Pursuant to USEPA regulations, Best Available Control Technology (BACT) emission limits are required for facilities that emit, or have the potential to emit, minimum limits of any state nonattainment pollutants. Based on the project's maximum calculated emissions, each permit unit must be equipped with BACT for NO_x, VOC, PM₁₀, SO_x and CO. (Ex. 64, p. 19.) The Air District defines BACT as the most stringent emission limit or control technology that has been achieved

in practice.³¹ SCAQMD filed its Final Determination of Compliance (FDOC) for the Project on October 10, 2000 (Ex. 73) including a determination for Best Available Control Technology (BACT). In addition, CARB adopted guidance for district permitting decisions that contains recommendations for BACT. (Ex. 73.)

Construction Mitigation. As mentioned above, the construction of the project will cause PM₁₀ emissions, which will add to the existing violations of the ambient PM₁₀ air quality standard. Staff has demonstrated that this is a potentially significant impact. The implementation of the staff recommended construction mitigation measures (**AQ-25** and **AQ-26**) will be effective in reducing the short-term impacts of the project to a level of less than significance. (Ex. 64, p. 39.)

Operation Mitigation. Applicant proposes to mitigate the emission increases from the proposed facility using a combination of clean fuel, emission control devices and emission reduction credits. The applicant proposes to use a combination of dry low-NO_x combustion design, Selective Catalytic Reduction (SCR) and high-temperature CO oxidation catalyst technology for each of the combined cycle turbine trains to minimize its NO_x and CO emissions. The proposed control devices are designed to maintain the turbine/duct burner emissions to 2.5 ppm NO_x over a 1-hour averaging period, 4 ppm CO, and 2 ppm VOC. We note that Applicant has proposed, for a period of three years commencing with commercial operation, to conduct a demonstration program to determine whether the facility can be reliably and continuously operated at a NO_x emission level of 2 ppm. After three years, if the facility can be operated consistently with the lower NO_x limit, TMPP will accept a permit condition of 2 ppm NO_x permanently. The ammonia slip emissions (from unreacted ammonia in the SCR) will be maintained at 5 ppm or less. Natural gas will be the only fuel used, which will minimize the project's PM₁₀ and SO_x emissions. In addition, the applicant will install a hybrid (wet and dry) cooling towers and equip the cooling towers with

³¹ The terms State BACT and Federal Lowest Achievable Emission Rate (LAER) are used interchangeably in this decision. (Ex. 1, § 6.8.2.)

high efficiency drift eliminators that limit the drift rate to 0.0005 percent. The drift eliminators will minimize the cooling towers' PM₁₀ emissions. (Ex. 64, p. 36.) The proposed dry low- NO_x and SCR system control, the CO oxidation catalyst system, and the use of the hybrid cooling tower that is also equipped with high efficient drift eliminator represent feasible mitigation, and are consistent with the District, the ARB and EPA recommendations for BACT. (Ex. 64, p. 39.)

SCONOX. Newer technologies such as SCONOXTM can reduce NO_x and CO emissions without the use of ammonia or oxidation catalyst. (Ex. 73.) The USEPA currently requires consideration of these alternatives in the BACT analysis. Applicant and Staff investigated SCONOXTM technology and concluded that it has not yet been demonstrated on large turbines. (Ex. 1, § 6.8.2.1.) In the analysis, Applicant found the applicability to a project of this size to be questionable. Applicant research found no data to demonstrate that BACT emission limits are technologically feasible with SCONOXTM technology on turbines larger than 25 MW. (Ex. 1, § 6.8.2.1.4.)

Staff also analyzed SCONOXTM technology with similar results. There is some debate over whether SCONOXTM is technically feasible when applied to a combustion turbine as large as the GE Frame 7F. ABB Environmental has issued a press release stating that the SCONOXTM technology is commercially ready for any size turbine. However, the largest turbine that SCONOX has been applied to is a GE LM2500, approximately 25 MW in capacity or about 1/6 the size of those proposed for TMPP. The Otay Mesa Power Project (which will use Frame 7F turbines) has issued a press release stating that they intend to use the SCONOXTM technology as their primary NO_x and CO control method. The Nueva Azalea Project also proposed to use the SCONOX technology, but the certification process in that matter is currently suspended. (Ex. 64, p. 44.)

SCONOXTM would not require an oxidizing catalyst or the use of ammonia to control NO_x and CO emissions. SCONOXTM technology employs a reactive

catalyst that must be regenerated on a regular basis. The catalyst reacts with CO and NO to form CO₂, that is emitted, and NO₂, that is absorbed on the surface of the catalyst until it is saturated. Prior to saturation, the catalyst is regenerated. This is done by sealing off the catalyst from the exhaust stream by a pair of mechanical louver doors and subjecting it to a mixture of natural gas and steam, which forms hydrogen to produce elemental nitrogen and CO₂, that are emitted through the stack. ABB Environmental requires that the catalyst in each module be removed and put through a regenerative bathing process once a year. Staff has some concern that this bathing process may result in an additional hazardous waste stream. The time required for this process is not clearly known, but it is likely to be approximately 1-2 weeks. Also, there may be a requirement that liquefied natural gas be stored on site to be used during the regular regeneration process of the catalyst throughout the year. (Ex. 64, p. 45.)

ABB Environmental has submitted a proposal for the SCONOXTM system. ABB proposes 15 SCONOXTM modules in an assembly to control NO_x and CO to 2 ppm each, for each Frame 7F turbine with a capital cost of \$26 million. ABB Environmental has tested the louver doors used by each module under both static and dynamic thermal conditions similar to those found in the Frame 7F exhaust stream. However, the testing did not include realistic flow or emission conditions that can be expected in an actual installation on an F-size turbine. Control algorithms have not yet been developed, nor tested for the 15 or more SCONOXTM modules. Due to the lack of appropriate testing and information, some HRSG manufacturers have expressed reluctance to issue guarantees for their equipment if SCONOXTM is installed. (*Ibid.*)

Staff believes that the SCONOXTM technology is a proven NO_x and CO emission abatement system without the use of ammonia. Staff concludes, however, that the SCONOXTM technology is **not** applicable for projects such as TMPP. Staff reached this conclusion based on three points:

First, the SCONOXTM performance guarantee requires an inlet NO_x concentration of 9 ppm, which is the lowest level achieved by a combustion turbine/dry low NO_x system. Because a typical turbine's NO_x emissions could emit a NO_x concentration as high as 15 ppm, the SCONOXTM guarantee of 2 ppm NO_x emission is not applicable.

Second, the guarantee for the SCONOXTM catalyst is voided if it is exposed to liquid water. TMPP has asked ABB to provide a proposal for a heat recovery steam generator/SCONOXTM system because steam generator vendors cannot guarantee the performance of their steam generators due to the possible uneven heat stress cause by the damper system for SCONOXTM. The ABB proposal is only for the SCONOXTM system, which voids all guarantees if the catalyst is exposed to liquid water. If the damper system actually causes an uneven heat distribution in the heat recovery steam generator, water tubes may experience heat stress and break. This would send liquid water to the SCONOXTM catalyst, which void the guarantee and render the system inoperable.

Third, SCONOXTM offers a 0.5 ppm NO_x improvement (2 ppm from the proposed 2.5 ppm) while potentially having many NO_x emission excursions, which may require more startup and shutdowns of the turbines, and can result in higher overall annual emissions. (Ex. 64, pp. 44-46.)

EPA Region IX requested and SCAQMD performed a "top down" NO_x BACT analysis to determine whether SCONOXTM should be BACT and required for the project. (Ex. 73, p. 7.) This analysis appears at pages 7-13 of the FDOC. Ex. 73.) The FDOC emphasizes that pursuant to District rules, BACT is meant to achieve the best available emissions limitation, without reference to a specific technology. (Ex. 73, p. 12.) The FDOC indicates that SCONOXTM is not presently available for large frame gas turbines because:

- it has only been used on small aeroderivative turbines and there is no

experience with the “scale up” application of SCONOX™ to larger turbines of the type used by the project;

- the technology remains “experimental and unacceptable at this time” because of lack of scale up experience and because there are several identified engineering concerns that have not been resolved for its application to larger turbines;
- the SCONOX™ vendor did not provide a complete and responsive proposal to the applicant that would meet the applicant’s necessary requirements to purchase and rely on the SCONOX™ technology;
- the SCONOX™ cost effectiveness analysis indicated costs that “were clearly above typical thresholds recognized as reasonable criterion levels by the South Coast Air Quality Management District (\$17,000/ton) and the Bay Area Air Quality Management District (\$17,500/ton);” and
- “it remains questionable whether emission limitations offered by the SCONOX™ vendor are achievable” without scale-up experience. (Ex. 73, pp. 8-10.)

BRG contends that SCONOX™ is an available and feasible technology to avoid ammonia use and uses its testimony as support. We find that testimony to be unpersuasive as compared to that described above. We agree with SCAQMD, Staff and Applicant and we find that SCONOX™ is not feasible for this project.

4. The Need for Additional Weather Data

BRG also asserts that the weather data used by the applicant to model emissions impacts did not meet federal requirements, and that the applicant was therefore required to collect one year of site specific data to repeat the modeling, citing Appendix W of 40 CFR 51, Section 9.3.1.2.a. (Ex. 77, p. 20.) BRG’s assertion and conclusions overlook other portions of the federal guidelines that indicate that no such data is needed **where specified modeling demonstrates no violations of federal requirements**. Applicant modeled emissions using

meteorological data from Brush Mountain. (12/18 RT 141.) This original modeling relied on meteorological data that may not have complied with federal requirements. CURE, BRG and Staff raised this issue early in the proceeding and Applicant agreed to provide further modeling using extremely conservative “worst-case” meteorological assumptions. (12/18 RT 142.) Both the Screen3 and ISCST3 model using were used with **default meteorological data**. (Ex. 66, App. 24, p. 14.) The analysis used very conservative scaling factors. (*Ibid.*) Staff confirmed this approach was consistent with EPA guidelines, including discussions with EPA’s Region IX air quality office. (12/18 RT 232-233).

This modeling indicated no violations of the federal National Ambient Air Quality Standards (NAAQS) or Prevention of Significant Deterioration (PSD) requirements. (Ex. 64, p. 43; Ex. 69, p. 24.) Staff testified that this is consistent with federal requirements, and that EPA confirmed that the applicant’s approach was sufficient. (12/18 RT 232.) Applicant’s witness gave similar testimony. (12/18 RT 142.) This approach is consistent with 40 CFR 51 Appendix W, which at Section 2.3.a provides as follows:

In addition to the various classes of models, there are two levels of sophistication. The first level consists of general, relatively simple estimation techniques that provide conservative estimates of the air quality impact of a specific source, or source category. These are screening techniques or screening models. The purpose of such techniques is to eliminate the need of further more detailed modeling for those sources that clearly will not cause or contribute to ambient concentrations in excess of either the National Ambient Air Quality Standards (NAAQS) or the allowable prevention of significant deterioration (PSD) increments.

BRG asserts, without citation of authority, that no substitute modeling could be performed without “comprehensive review and consensus,” a written record, and public notice. However, no such protocol is required by law, and the applicant’s

approach to modeling concerning the sufficiency of the Brush Mountain data was discussed at length in these proceedings. Applicant provided all parties the results of its screening modeling last spring, months prior to hearings. No issues with the modeling were raised then, and none are raised now beyond the bare assertion that a screening modeling cannot be used when sufficient meteorological data is unavailable.³²

Applicant provided the Air District and CEC Staff with a screening analysis that determined the Project would not exceed any national ambient air quality standard or PSD increment. SCAQMD and Staff concluded that the default meteorological data used in the screening analysis was adequately conservative for estimating worst-case ambient air quality impacts and complied with the modeling requirements stated in Title 40 of the Code of Federal Regulations, parts 51 and 52. Consequently, more refined modeling was not required for the Project. (Ex. 69, Rebuttal Air Quality Testimony, pp. 23-24; 12/18 RT 187-192, 233.) Notwithstanding BRG's claims, the record establishes that applicant's modeling was an acceptable alternative to 12 months of site meteorological data.

FINDINGS AND CONCLUSIONS

Based on the uncontroverted evidence of record, the Commission makes the following Findings:

³² BRG's Opening Brief asserts that the Brush Mountain weather data cannot be used because of requirements of 40 CFR 51, Appendix W, § 9.3.2.2. However, nothing in that section prohibits the use of the Brush Mountain data. Staff's concern about the sufficiency of the Brush Mountain data was based on the requirements of a subsequent section, § 9.3.3.2, regarding site-specific data collection. This section references other documents recommending criteria for instrumentation, data recording, and completeness, among other things. Although the Brush Mountain data was largely consistent with the recommendations of the referenced documents, there were shortcomings in the data that led Staff to request the further analysis. The BRG witness testified that he was unaware of these referenced documents as the basis for determining the sufficiency of the Brush Mountain data. (12/18 RT 252.)

1. National ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS) have been established for six air contaminants identified as criteria air pollutants, including sulfur dioxide (SO₂), carbon monoxide (CO), ozone (O₃), nitrogen dioxide (NO₂), lead (Pb), and particulate matter less than 10 microns in diameter (PM₁₀) and their precursors: nitrogen oxides (NO_x), volatile organic compounds (VOC), and sulfates (SO_x).
2. The Shasta County Air Quality Management District (Air District or SCAQMD) has jurisdiction over the area where the project site is located.
3. The Air District is a non-attainment area for both the state ozone and PM₁₀ standards and attainment or unclassified for all other criteria pollutants and for all federal requirements.
4. Construction and operation of the project will result in emissions of criteria pollutants and their precursors.
5. Applicant will employ the best available control technology (BACT) to limit pollutant emissions by installing SCR technology.
6. Project NO_x emissions are limited to 2.5 parts per million (ppm) corrected at 15 percent oxygen average over one hour.
7. Project ammonia slip emissions resulting from use of SCR is limited to a rate of 5 ppm.
8. No adverse public health effects will result from the 5 ppm ammonia slip maximum limit.
9. Applicant has secured all the required offsets and agreed to sufficient other mitigation to fully mitigate the project's emissions.
10. Project emissions will not result in cumulative impacts to air quality in the project vicinity.
11. Project emissions are well below levels of concern for California plants and soils in the project area.
12. Implementation of the Conditions of Certification, below, ensures that TMPP will not result in any significant adverse impacts to air quality.

The Commission, therefore, concludes that with implementation of the Conditions of Certification, below, and the mitigation measures described herein and in the evidentiary record, the Three Mountain Power Project will conform with all applicable laws, ordinances, regulations, and standards relating to air quality as

set forth in the pertinent portions of Appendix A of this Decision.

CONDITIONS OF CERTIFICATION

AQ-1 The Authority to Construct (PSD Permit) issued by the Shasta County Air Quality Management District is issued in accordance with the rules and regulations of the District and pursuant to the delegation of PSD authority by the Environmental Protection Agency (EPA), Region IX, on July 8, 1985. If any provision of this permit is found invalid, such finding shall not affect the remaining provisions. [Non-PSD]

Verification: The project owner shall provide a copy to the CPM of the final Authority to Construct/Prevention of Significant Deterioration permit 15 days upon its issuance by the Shasta County Air Pollution Control District.

AQ-2 The owner/operator must obtain an Authority to Construct (PSD Permit) from the District and certification from the California Energy Commission (CEC) prior to commencing construction on the project site. If a permit is required from the U.S. Fish & Wildlife Service or the California Department of Fish and Game regarding impacts to endangered species, then the owner/operator shall be responsible for assuring that these requirements are met to the satisfaction of the above-named agencies and EPA Region IX as required by law. [PSD]

Verification: The project owner shall provide a copy to the CPM of the final Authority to Construct/Prevention of Significant Deterioration permit 15 days upon its issuance by the Shasta County Air Pollution Control District.

AQ-3 In the event of any changes in control or ownership of facilities to be constructed or modified, this Authority to Construct (PSD Permit) shall be binding on all subsequent owners and operators. The applicant shall notify the succeeding owner and operator of the existence of this Authority to Construct (PSD Permit) and its conditions by letter, a copy of which shall be forwarded to the Air Pollution Control Officer (APCO) of the Shasta County Air Quality Management District (District), the California Air Resources Board (CARB), and the EPA. [PSD]

Verification: No later than 30 days following a Commission approved change of ownership, the project owner will forward to the CPM a copy of the letter that notifies the succeeding owner and operator of the existence of the Authority to Construct/Prevention of Significant Deterioration permit and the conditions contained therein.

AQ-4 Equipment is to be maintained so that it operates as it did when the permit was issued.

Verification: See Verification of Condition **AQ-59**.

AQ-5 If construction has not physically commenced on the site within two (2 years) from the date of issuance of this permit, the Authority to Construct (PSD Permit) shall become invalid in accordance with District Rule 2:12. [Non-PSD]

Verification: The project owner shall submit to the District a copy of the CPM's authorization to commence construction.

AQ-6 Acceptance of this permit is deemed acceptance of all conditions as specified. All equipment, facilities, and systems shall be designed and operated in a manner that maintains compliance with the conditions of this permit, applicable provisions of 40 CFR Parts 52, 60, 61, 68, 72 and any other applicable local, State, or Federal regulations. Failure to comply with any condition of this permit or the Rules and Regulations of the District shall be grounds for revocation, either by the APCO or the District Hearing Board. [PSD]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, EPA and/or the Commission.

AQ-7 The District reserves the right to amend this permit, if the need arises, in order to insure compliance of this facility with applicable local, State, or Federal regulations, or to abate any public nuisance. [Non-PSD]

Verification: The project owner shall seek prior approval from the District and the Commission prior to any modification deemed necessary to comply with Condition **AQ-7**.

AQ-8 Periods of excess emissions, upsets, breakdowns, or malfunctions shall be reported to the District, in accordance with District Rule 3:10, within four hours of occurrence. In no event shall the equipment be operated with the emission control equipment in a malfunctioning condition beyond the end of the work shift or 24 hours, whichever occurs first. [Non-PSD]

Verification: The project owner shall notify the District of excess emissions, upsets, breakdowns, or malfunctions within four hours of occurrence. Copies of excess emissions or breakdown reports shall be included in the monthly reports required in Condition **AQ-59**.

AQ-9 This facility is subject to all applicable requirements of the Air Toxics "Hot Spots" Information and Assessment Act of 1987, as cited in California

Health and Safety Code Sections 44300 et seq. [Non-PSD]

Verification: Project owner shall prepare and submit to the District a Toxic Hot Spots emission inventory by the first month of August following the first full calendar year of facility operational history.

AQ-10 This facility is subject to the applicable provisions of Title V of the Federal Clean Air Act of 1990. [Non-PSD]

Verification: Within twelve months after operational startup, the project owner shall apply for, and shall provide the CPM a copy of the Title V Federal Operating Permit within 30 days from the date of receiving such permit.

AQ-11 The right of entry described in California Health and Safety Code Section 41510, Division 26, shall apply at all times. The Regional Administrator of the EPA, the Executive Officer of the California Air Resources Board, the APCO, and/or their authorized representatives, upon the presentation of credentials shall be permitted:

- a) to enter upon the premises where the source is located or in which any records are required to be kept under the terms and conditions of this Authority to Construct; and
 - b) at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this Authority to Construct; and
 - c) to inspect any equipment, operation, or method required in this Authority to Construct; and
 - d) to sample emissions from any and all emission sources within the facility.
- [Non-PSD]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, EPA and/or the Commission.

AQ-12 The owner/operator shall maintain all records and reports on site for a minimum of 5 years. These records shall include but are not limited to: continuous monitoring records (firing hours, fuel flows, continuous emissions records, excess emissions, breakdowns, etc.), source test and analytical records, emission calculation records, records of plant upsets and related incidents. All records and emission test results requested to be kept under the terms and conditions of this Authority to Construct shall be made available to the District staff upon request. [Non-PSD]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, EPA and/or the Commission.

AQ-13 The operating staff with management authority at this facility shall be advised of and be familiar with all the conditions of this permit. [Non-PSD]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, EPA and/or the Commission.

AQ-14 References to rules, regulations, etc., within this permit shall be interpreted as referring to such rules and regulations in their present configuration and language as of the date of issuance of this permit. [Non-PSD]

Verification: The project owner shall provide copies to the CPM of the Permits to Operate issued by the District within 30 days of receipt of such Permits.

AQ-15 The owner/operator shall provide the following Best Available Mitigation Measures in accordance with the Air Quality Element of the Shasta County General Plan upon startup:

- a) On-site services such as food vending machines as appropriate and in compliance with local development regulations.
 - b) Mobile lunch service to serve the facility if available.
 - c) On-site pedestrian facility improvements such as walking paths and building access which are physically separated from street and parking lot traffic.
 - d) A parking lot design that does not impede a clear, direct pathway for safe, easy movement of pedestrians.
 - e) Adequate bicycle storage/parking facilities at a minimum of one bicycle space for every 20 automobile spaces.
 - f) Preferential parking spaces for carpools and van pools.
- [Non-PSD]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, EPA and/or the Commission.

AQ-16 As per California Health & Safety Code Section 41700, no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injure or damage to business or property. [Non-PSD]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, EPA and/or the Commission.

AQ-17 The owner/operator shall provide to the California Energy Commission (CEC) Construction Project Manager (CPM) a copy of the facility Permit(s) to Operate within fifteen days of issuance. [Non-PSD]

Verification: The project owner shall provide to the CPM a copy of the Permit to Operate within 15 days of its issuance by the District.

AQ-18 The owner/operator shall certify compliance with the requirements of 40 CFR Part 68 Risk Management Plan requirements as applicable as part of the compliance certification required by Title V of the Federal Clean Air Act. [Non-PSD]

Verification: The project owner shall submit a copy of the certification of compliance with the requirements of 40 CFR Part 68 Risk Management Plan to the CPM.

AQ-19. The owner/operator shall meet the provisions of the Federal Acid Rain Program (Title IV) program by filing for an Acid Rain permit 24 months before operational startup and by certifying NO_x and O₂ CEMs within 90 days after operational startup. [Non-PSD]

Verification: No more than 30 days after receiving the federal Acid Rain permit, the project owner shall provide the District and the CPM a copy of such permit.

AQ-20 If General Electric PG7241FA gas turbines are utilized for the project, the total NO_x Emission Reduction Credits (ERC) purchased for the project shall be 144 tons/year (71,014 pounds in Calendar Quarter I, 71,803 pounds in Calendar Quarter II, 72,592 pounds in Calendar Quarter III, and 72,592 pounds in Calendar Quarter IV). The total VOC ERCs purchased for the project shall be 41 tons/year (20,219 pounds in Calendar Quarter I, 20,444 pounds in Calendar Quarter II, 20,668 pounds in Calendar Quarter III, and 20,668 pounds in Calendar Quarter IV). The ERC's shall be purchased from Sierra Pacific Industries, Inc. available on Certificate No. 97-ERC-02 previously entered in the District ERC bank.

If Westinghouse 501F gas turbines are utilized for the project, the total NO_x Emission Reduction Credits (ERC) purchased for the project shall be 130 tons/year (64,116 pounds in Calendar Quarter I, 64,818 pounds in Calendar Quarter II, 65,534 pounds in Calendar Quarter III, and 65,534 pounds in Calendar Quarter IV). The total VOC ERCs purchased for the project shall be 65

tons/year (32,058 pounds in Calendar Quarter I, 32,409 pounds in Calendar Quarter II, 32,656 pounds in Calendar Quarter III, and 32,656 pounds in Calendar Quarter IV). The ERCs shall be purchased from Sierra Pacific Industries, Inc. available on Certificate No. 97-ERC-02 previously entered in the District ERC bank.

[Non-PSD]

Verification: Thirty days prior to commencement of rough grading, the project owner shall provide the District and the CPM for approval the required documentation of this condition.

AQ-21 Paving of unpaved portions of any of the following roads in the Burney area shall be provided in order to create an emission offset of either 138 tons per year (based on use of General Electric PG7241FA turbines @ 75% of the project's 184 tons/year PM₁₀ emissions) or 115.5 tons per year (based on use of Westinghouse 501F turbines @ 75% of the project's 154 tons/year PM₁₀ emissions) quantified in a manner acceptable to the APCO and CEC CPM by using Sections 13.2.1 and 13.2.2 of EPA's Compilation of Air Pollution Emission Factors AP-42 document:

ROADS
Goose Valley Road
Estes Avenue
Fairfield Street
Goose Creek Road
Vallejo Street
Apple Orchard Lane
Bailey Ave.
Cottonwood Street
Tamarack Road
Washburn Road
Ivan Marx Road
Pit River Casino Parking Lot
Mountain View Road

Note: The road selection and distance of the roads to be paved above may be changed upon approval of the APCO and the CEC CPM provided that the total PM₁₀ offset remains the same. A copy of executed legally binding contracts between the applicant and Shasta County or any applicable road maintenance

district shall be provided to the District and the CEC CPM at the conclusion of paving, ensuring the maintenance of said roads or paved areas.

[Non-PSD]

Verification: No later than 30 days prior to commencement of construction, the project owner shall provide the District and the CPM the appropriate documentation that the emission offsets have been secured per the requirements of this condition. That documentation shall include all assumptions, data and calculations to derive the lengths of roads to be paved. At the conclusion of road paving, the project owner shall provide a copy to the District and the CPM of the executed legally binding contracts between the project owner and Shasta County or any applicable road maintenance district ensuring the maintenance of said road or paved areas. No more than thirty days after paving the roads, the project owner shall provide pictures of before and after road paving.

AQ-22 A fireplace retrofit/woodstove replacement fund shall be made available on a first-come, first-serve basis to finance a five-year voluntary woodstove replacement/fireplace retrofit program which shall provide a minimum PM₁₀ emission offset of either 46 tons/year (based on use of General Electric PG7241FA turbines @ 25% of the project's 184 tons/year PM₁₀ emissions) or 38.5 tons/year (based on use of Westinghouse 501F turbines @ 25% of the project's 154 tons/year PM₁₀ emissions). The replacement fund shall pay for the retrofit/ replacement costs of at least 465 (based on use of General Electric PG7241FA turbines) or 389 (based on use of Westinghouse 501F turbines) current non-EPA certified fireplaces and woodstoves (up to a maximum of \$1225 for each retrofit/replacement) with either an EPA-certified solid fuel heating device, a propane heating device, or a natural gas heating device. The fund shall be capable of being drawn upon in any year of the five year program and as allowed by conditions of CEC certification until the fund is depleted. Each resident participating in the retrofit/replacement program would only do business with the retailer and a professional, licensed installer. Payments shall be made to vendors or contractors who agree to participate in the program and who submit certification that the retrofit/replacement was permanent (by dedicated natural gas, or propane fuel, or permanent removal of the woodstove doors and proper recycling of the old stove), conformed to the program, and resulted in direct savings to the consumer/end user. Quarterly status reports on the program and the status of the reimbursements and remaining fund available shall be made to the APCO and the CEC Construction Project Manager. For the first three years of the program, homes and businesses located within a six-mile radius of the proposed facility will be eligible to participate in the program. After the initial three years of the program period expire, if the fund has not been exhausted, homes and businesses within a fifteen-mile radius of the TMPP facility will be eligible to participate in the program in the fourth and fifth years. If the fund still has not been exhausted after the fifth year, the remaining amount will either be used to pave additional roads or be paid to Shasta County for use in PM₁₀ emissions reduction programs administered by the Shasta County AQMD. The fund shall be audited annually and a report of program activity shall be submitted

to the District and CEC project manager each year for review. [Non-PSD]

Verification: No later than 30 days prior to commencement of construction, the project owner shall provide the District and the CPM a copy of the approved wood stove replacement program. Quarterly status reports on the program and the status of the reimbursements and remaining funds available shall be submitted to the APCO and the CPM. The project owner shall submit by January 31 of each year to the District and the CPM a copy of the annual audit report.

AQ-23 The facility shall comply with all portions of the Federal New Source Performance Standards 40 CFR 60, Subpart A (General Provisions), Subpart Da (Standards of Performance for Electric Utility Steam Generating Units), and Subpart GG (Standards of Performance for Stationary Gas Turbines). Notification with respect to commencement of construction (30 day notice), anticipated date of startup (30 day notice), actual date of startup (within 15 days), and modifications which could increase emission rates (60 days or as soon as practicable) shall be provided to the EPA Administrator in accordance with 40 CFR 60.7. [PSD]

Verification: The project owner shall provide documentation to the District and CPM of the following notifications: 30 days prior to commencement of construction, 30 days prior to anticipated project start-up, within 15 days after actual date of start-up, and an amendment request to the CPM, and Commission approval of the request prior to increasing any emission limit in these Conditions of Certification.

AQ-24 This facility is subject to the applicable provisions of the National Emission Standards for Hazardous Air Pollutants for Combustion Turbines when the Standards in their final form are promulgated by EPA. Emission limits stated in the above provisions, however, do not supersede more stringent limits found in other conditions of this permit. [PSD]

Verification: The project owner shall provide copies to the CPM of the Permits to Operate issued by the District within 30 days of receipt of such Permits.

CONSTRUCTION PHASE CONDITIONS

AQ-25 During construction of this facility, the following fugitive emission control measures shall be implemented at the plant site:

- Suspend all land clearing, grading, earth moving, or excavation activities when winds (including instantaneous gusts) exceed 20 miles per hour.
- Apply water to active construction sites and unpaved roads at least twice daily to control fugitive dust.

- Apply sufficient water or dust suppressants to all material excavated, stockpiled, or graded to prevent fugitive dust from leaving the property boundaries and causing a public nuisance or a violation of an ambient air standard.
- Apply a non-toxic solid stabilizer to all inactive construction areas (previously graded areas which remain inactive for 96 hours).
- No on-site vehicle shall exceed a speed of 10 miles per hour on unpaved roads or areas.
- All trucks hauling dirt, sand, soil, or other loose material will be watered or covered and will maintain at least two feet of freeboard to prevent a public nuisance.
- Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off trucks and any equipment leaving the site each trip.
- Sweep streets with a water sweeper at the end of each day if visible soil materials are carried onto adjacent public or private paved roads.
- Re-establish ground cover on the construction site through seeding and watering as soon as possible, but no later than final occupancy.
- Implement all dust control measures in a timely and effective manner during all phases of project development and construction.
- Place sandbags adjacent to roadways to prevent run off to public roadways.
- Install wind breaks at the windward sides of construction areas prior to the soil being disturbed. The wind breaks shall remain in place until the soil is stabilized or permanently covered.
- Limit construction vehicles and equipment idle time to no more than 15 minutes.

[Non-PSD]

Verification: The project owner shall maintain a daily log of water truck activities, including record of the frequency of public road cleaning. These logs and records shall be available for inspection by the CPM during the construction period. The project owner shall identify in the monthly construction reports, the area(s) that the project owner shall cover or treat with dust suppressants. The project owner shall make the construction site available to the District staff and the CPM for inspection and monitoring.

AQ-26 The project owner shall install oxidizing soot filters on all suitable construction equipment used either on the power plant construction site or on associated linear construction sites. Suitability is to be determined by an independent California Licensed Mechanical Engineer, in consultation with the Air Resources Board (ARB), who will stamp and submit for approval an initial and all subsequent Suitability Reports. Where the oxidizing soot filter is determined to be unsuitable, the owner shall install and use an oxidation catalyst. In addition, ultra-low sulfur fuel (<15 ppm sulfur) shall be used whenever feasible.

The initial Suitability Report shall contain, at a minimum, the following:

INITIAL SUITABILITY REPORT

- A list of all fuel burning, construction related equipment used,
- A determination of the suitability of each piece of equipment to firstly work appropriately with an oxidizing soot filter,
- A determination of the suitability of each piece of equipment to secondarily work appropriately with an oxidation catalyst,
- If a piece of equipment is determined to be suitable for an oxidizing soot filter,
- If a piece of equipment is determined to be unsuitable for an oxidizing soot filter, an explanation by the independent California Licensed Mechanical Engineer as to the cause of this determination,
- If a piece of equipment is determined to be unsuitable for an oxidizing soot filter, but suitable for an oxidation catalyst,
- If a piece of equipment is determined to be unsuitable for both an oxidizing soot filter and an oxidizing catalyst, an explanation by the independent California Licensed Mechanical Engineer as to the cause of this determination, and
- If ultra-low sulfur diesel fuel is not used, an evaluation of the feasibility of using ultra-low diesel fuel on construction equipment equipped with oxidizing soot filters or oxidizing catalysts.

INSTALLATION REPORT

Following the installation of either the oxidizing soot filter or oxidizing catalyst as prescribed in the Initial Suitability Report, a California Licensed Mechanical Engineer will issue an Installation Report that either confirms that the installed device is functioning properly or that installation was not possible and the cause.

SUBSEQUENT SUITABILITY REPORTS

If a piece of construction equipment is subsequently determined to be unsuitable for an oxidizing soot filter or oxidizing catalyst after such installation has occurred, the filter or catalyst may be removed immediately. However, notification must be sent to the CPM and ARB for approval containing an explanation for the change in suitability within 10 days. Changes in suitability are restricted to the following three explanations that must be identified in any subsequent suitability report. Changes in suitability may not be based on the use of high-pressure fuel injectors, timing retardation and/or reduced idle time.

- The filter or catalyst is reducing normal availability of the construction equipment due to increased downtime, and/or power output due to excessive increased backpressure.

- The filter or catalyst is causing or reasonably expected to cause significant damage to the construction equipment engine.
- The filter or catalyst is causing or reasonably expected to cause a significant risk to nearby workers or the public

Verification: The project owner will submit to the CPM and ARB for approval, the initial suitability report stamped by an independent California Licensed Mechanical Engineer, 30 days prior to breaking ground on the project site. The project owner will submit to the CPM and ARB for approval, subsequent suitability reports as required, stamped by an independent California Licensed Mechanical Engineer no later than 10 working days following a change in the suitability status of any construction equipment.

OPERATING CONDITIONS

AQ-27 Combustion turbines and duct burners shall be exclusively fueled with California PUC pipeline quality natural gas with a sulfur content not to exceed 0.4 grain per 100 standard cubic feet. [PSD]

Verification: The project owner shall secure documentation from the natural gas suppliers of the sulfur content of the fuel and submit such documentation as required in Condition **AQ-59(g)**.

AQ-28 A continuous monitoring system shall be installed and maintained to monitor and record the fuel consumption being fired in each power train. The system must be accurate to within plus or minus five percent. [PSD]

Verification: At least ninety days prior to the start of rough grading, the project owner shall submit to the District and the CPM for approval the final selection and design details of the gas turbines and associated equipment, including all proposed post combustion control systems.

AQ-29 The project owner shall collect ambient concentration of ozone and PM₁₀ at the site of the previously existing Burney monitoring station for a continuous period of not exceeding five calendar years. Two years of which will be prior to actual operation of the facility.

Verification: Forty-five days following the end of each quarter, the project owner shall provide a quarterly report of the monitoring results of the previous quarter to the District and the CPM.

AQ-30 A continuous monitoring system complete with ammonia flow meter and injection pressure indicator shall be installed and maintained to monitor and

record the ammonia injection rate on each SCR system. The system must be accurate to within plus or minus five percent. [PSD]

Verification: At least ninety days prior to the start of rough grading, the project owner shall submit to the District and the CPM for approval the final selection and design details of the gas turbines and associated equipment, including all proposed post combustion control systems.

AQ-31 Instrument shall be installed and maintained on each gas turbine power train to measure electrical energy production. [Non-PSD]

Verification: At least ninety days prior to the start of rough grading, the project owner shall submit to the District and the CPM for approval the final selection and design details of the gas turbines and associated equipment, including all proposed post combustion control systems.

AQ-32 Prior to the initial firing of any fuel through either power train, a continuous emission monitoring system (CEM) shall be installed, calibrated, and operated on each HRSG exhaust to measure volumetric flow and concentrations of NO_x and CO, and percent O₂. The system shall meet monitoring and quality assurance specifications as required by *40 CFR 60.13*; *40 CFR 60*, Appendix B, Specifications 2, 3, 4, 6; and *40 CFR 60*, Appendix F except that due to the extremely low permitted limits for NO_x and CO concentrations, the relative accuracy procedure shall be defined as conducting a complete CEMS status check on an annual basis following the manufacturer's written instructions. The check should include operation of the light source, signal receiver, timing mechanism functions, data acquisition and data reduction functions, data recorders, mechanically operated functions (mirror movements, calibration gas valve operations, etc.), sample filters, sample line heaters, moisture traps, and other related functions of the CEMS, as applicable. The monitoring systems must also successfully pass the calibration and drift requirements of the equipment manufacturer. (Reference *40 CFR 266*, Appendix IX, Section 2.1.9.) All continuous monitoring devices are to be re-calibrated quarterly in accordance with procedures under Section 60.13(b) of *40 CFR 60*.

The system shall continuously record the measured concentrations, and shall calculate and continuously record the NO_x and CO concentrations corrected to a value at 15 percent O₂, dry. The NO_x and CO CEMs shall have the capability of recording NO_x and CO concentrations during all operating conditions, including startups and shutdowns. Multiple range analyzers or additional "coarse range" analyzers shall be provided as necessary to measure higher concentrations during startup periods. Due to the low concentrations of NO_x with appreciable NO₂ expected during operation, chillers or condensers shall not be utilized in the CEMs for measuring NO_x concentrations.

A computer data acquisition system which has the capability of interpreting the

sampling data; providing a graphical trend analysis; and producing summary reports of the respective 1-hour and 3-hour averages of NO_x and CO, and pounds per day and tons per year of NO_x, CO, PM₁₀, SO_x, and VOC emissions. The summary reports shall also include calculations of cooling tower PM₁₀ emissions. [PSD]

Verification: At least ninety days prior to the start of rough grading, the project owner shall submit to the District and the CPM for approval the final selection and design details of the gas turbines and associated equipment, including all proposed post combustion control systems.

AQ-33 As per District Rule 2:1A.b.2., the initial commissioning period shall not exceed more than 60 days (commencing with the first firing of fuel in the power train). The owner/operator shall minimize emissions to the maximum extent possible during the commissioning period.
[Non-PSD]

Verification: At least 90 days prior to first firing of the facility, the project owner shall submit to the APCO and the CPM for their approval an Initial Commissioning Test Plan that will include, but not be limited to the following:

- A description of the initial commissioning activities that will take place,
- The duration, in hours, of each initial commissioning activity,
- A quantification of the criteria pollutant emissions, in either pounds per hour, or pounds per event, and
- A description of what air emissions limiting equipment will be in place and operating during each initial commissioning activity.

AQ-34 Best Available Control Technology for the combustion turbines shall be defined as the following emission control technologies applied to each combustion turbine capable of achieving the emission standards specified in Condition AQ-38 of this permit:

Particulate Matter	State-of-the-art combustion turbines, good combustion practices, mist eliminators for lube oil vents, exclusive combustion of natural gas containing no more than 0.4 grain of sulfur per 100 standard cubic feet of natural gas
Oxides of Nitrogen	Dry low-NO _x combustors, low-NO _x duct burners, selective catalytic reduction with ammonia injection
Reactive Organic Compounds	Good combustion practices, coincidental VOC reduction by the use of a CO oxidation catalyst
Carbon Monoxide	Good combustion practices and use of a CO oxidation catalyst

[PSD]

Verification: At least ninety days prior to the start of rough grading, the project owner shall submit to the District and the CPM for approval the final selection and design details of the gas turbines and associated equipment, including all

proposed post combustion control systems.

AQ-35 Best Available Control Technology for the cooling tower shall be defined as the following emission control technologies capable of achieving the emission standards specified in Condition **AQ-44** of this permit:

Particulate Matter	Hybrid configuration (wet and dry). Wet cooling tower equipped with 0.0005% drift rate drift eliminators, TDS limit of 5000 mg/liter
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Verification: At least thirty days prior to installation, the project owner shall submit to the District and the CPM a copy of the performance guarantee letter from the cooling tower manufacturer.

AQ-36 The dates and results of all visible emission evaluations required by Condition **AQ-38** shall be recorded in a log and maintained for five years for District inspection upon request.

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, EPA and/or the Commission.

AQ-37 The following opacity limits shall apply at all times:

Emission Point	Opacity Limit
HRSG Exhausts	20% for a period aggregating more than three (3) minutes in any one (1) hour, excluding uncombined water vapor as determined by EPA Method 9
Oil Mist Eliminator Vents	20% for a period aggregating more than three (3) minutes in any one (1) hour, excluding uncombined water vapor as determined by EPA Method 9
Emissions from Any Other Source on Site	40% or Ringlemann 2 for a period aggregating more than three (3) minutes in any one (1) hour, excluding uncombined water vapor

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, EPA and/or the Commission.

AQ-38 Emissions from each gas turbine, duct burner, and associated HRSG shall meet all of the emission limitations listed in a. through g. below for each power train at any firing rate and ambient conditions (except as noted in Condition **AQ-39**):

<u>Pollutant</u>	<u>GE</u>	<u>Westinghouse</u>	<u>Either _____ CTG Manufacturer</u>	<u>Verification</u>
NO _x as NO ₂	18.9 ² pounds per hour	16.8 ² pounds per hour	2.5 ppmvd ² , 1-hr rolling averaging @ 15% O ₂	Verified by CEMS and annual compliance test at maximum operating capacity of the turbines ¹
CO	18.5 pounds per hour	16.3 pounds per hour	4 ppmvd, 3-hr rolling averaging @ 15% O ₂	Verified by CEMS and annual compliance test at maximum operating capacity of the turbines ¹
Ammonia slip	12.8 pounds per hour	12.8 pounds per hour	5 ppmvd, 3-hour rolling averaging @ 15% O ₂	Verified by annual compliance test at maximum operating capacity of the turbines and continuous recording of the injection rate
VOC	5.3 pounds per hour	4.4 pounds per hour	2 ppmvd, 1-hour rolling averaging @ 15% O ₂	Verified by annual compliance test at maximum operating capacity of the turbines and VOC/CO algorithms developed from initial source tests
PM ₁₀ (filterable + condens able)	22.1 pounds per hour	16.4 pounds per hour	0.0012 grain/dscf, 1- hour averaging @ 3% CO ₂	Verified by annual compliance test at maximum operating capacity of the turbines and algorithms developed from initial source tests
Opacity			<20% for a period aggregating more than three (3) minutes in any one (1) hour, excluding uncombined water vapor as determined by EPA Method 9	Verified by monthly visible emission evaluations and annual compliance test at maximum operating capacity of the turbines
Sox as SO ₂	1.24 pounds per hour	1.24 pounds per hour		Verified by fuel sulfur content and fuel use data

Notes: ¹After the first **five** annual compliance tests and upon written request to the APCO with adequate justification (consistent demonstration of compliance),

the owner/operator may, if allowed by the APCO and the CPM, use CEM data to verify compliance with the NO_x and CO emissions specified above. The owner/operator may also reduce the frequency of testing for VOC and SO_x emissions from the HRSG exhaust and the PM₁₀ emission testing of the cooling tower after the first **five** annual compliance test if consistent demonstration of compliance has occurred and if allowed by the APCO in accordance with District Rule 2:11a.3.(f).

² The owner/operator shall install a SCR system that is designed to meet a NO_x emission limit of no more than 2.0 ppm, based on a 1-hour rolling average (Demonstration NO_x Limit), and guaranteed by the SCR vendor to meet the Demonstration NO_x Limit, to the extent that the SCR vendor will provide such a guarantee to the owner/operator. The owner/operator shall install, operate, and maintain the SCR system in a manner designed to achieve the Demonstration NO_x Limit, and in conformance with the SCR vendor's installation, operation, and maintenance procedures. For a period of three years commencing with commercial operations, the owner/operator will conduct a demonstration program with District and the CEC CPM oversight to determine whether the owner/operator is able to reliably and continuously operate while maintaining the Demonstration NO_x Limit. (The District shall consider allowable excess emissions in accordance with District Rule 3:10 when evaluating the facility's performance with respect to the Demonstration NO_x Limit. In addition, the District will consider whether the Demonstration NO_x Limit has been achieved on a consistent basis within the allowances under District Rule 3:10 with suitable compliance margin of at least 10% over the entire range of turbine operating conditions, including duct firing, and over the entire range of ambient conditions). Upon conclusion of this three-year demonstration program, if the District determines that the owner/operator can reliably and continuously operate while maintaining the Demonstration NO_x Limit, the owner/operator shall accept the Demonstration NO_x Limit and correspondingly adjusted hourly mass emission limitations in the facility's Permit to Operate. Should the District and the CEC CPM determine that the owner/operator cannot reliably and continuously operate while maintaining the Demonstration NO_x Limit, the NO_x emission limit in the facility's Permit to Operate shall remain unchanged.

[PSD]

Verification: See Condition **AQ-59** and its verification.

AQ-39 The emission limits in Conditions **AQ-38** shall not apply during any cold startup (which is not to exceed 4.5 hours in duration), hot startup (which is not to exceed 2.0 hours in duration), warm startup (which is not to exceed 2.5 hours in duration), or shutdown (which is not to exceed 1.0 hour in duration). Selective catalytic reduction (SCR), oxidation catalytic reduction, and good combustion practices shall be used whenever the combustion turbines are operating and to the fullest extent practical during startup and shutdown conditions to minimize

pollutant emissions. A stack damper shall be utilized as practical during shutdowns to retain heat in the HRSG in order to minimize startup emissions. Startup shall be defined as the period beginning with ignition and lasting until equipment has reached stable operating mode and has achieved operating permit limits. Cold startup means a startup when the CTG has not been in operation during the preceding 48 hours. Hot startup means a startup when the CTG has been in operation during the preceding 8 hours. Warm startup means a startup that is not a hot or cold startup. Shutdown shall be defined as the period beginning with the lowering of equipment from stable operating load with the intention of full shutdown and lasting until fuel flow is completely off and combustion has ceased.

Verification: See Condition **AQ-59** and its verification.

AQ-40 Emissions from each gas turbine, duct burner, and associated HRSG shall meet all of the emission limitations listed below per event for each power train in the various startup or shutdown modes defined in Condition **AQ-39**:

Pollutant	Cold Startup		Warm Startup		Hot Startup		Shutdown		Verification
	GE	W 501 F	GE	W 501 F	GE	W 501 F	GE	W 501 F	
NO _x as NO ₂ (pound)	21 5	140	138	123	75	112	38	38	Verified by CEMS
CO (pound)	75 0	1105	450	1114	425	847	175	175	
VOC (pound)	80	139	150	138	150	114	128	26	Calculated VOC/CO algorithms developed from initial source tests
PM ₁₀ (pound)	12 0	120	70	70	50	50	15	15	Calculated with fuel use and source tests
SO _x as SO ₂	5.6	5.6	3.1	3.1	2.5	2.5	1.24	1.24	

[PSD]

Verification: See Condition **AQ-59** and its verification.

AQ-41 The facility total emissions from gas turbine/HRSG power trains and cooling tower including periods of all equipment startups, shutdowns, and operational modes shall not exceed the following limits during any calendar day:

	GE	Westinghouse	Cooling Tower
PM ₁₀	657 pounds per day	503 pounds per day	37.5 pounds per day
NO _x as NO ₂	679 pounds per day	638 pounds per day	
CO	1832 pounds per day	2603 pounds per day	
SO _x as SO ₂	30 pounds per day	30 pounds per day	
VOC	258 pounds per day	386 pounds per day	
NH ₃	307 pounds per day	307 pounds per day	

[PSD]

Verification: See Condition **AQ-59** and its verification.

AQ-42 The facility total emissions from both gas turbine/HRSG power trains, and the cooling tower, including periods of all equipment startups, shutdowns, initial commissioning and operational modes, shall not exceed the following ton per year limits during any consecutive twelve-month period:

	GE (2CTGs)	Westinghouse (2CTGs)	Cooling Tower
PM ₁₀	167 tons per year	137 tons per year	7 tons per year
NO _x as NO ₂	144 tons per year	130 tons per year	
CO	268 tons per year	401 tons per year	
SO _x as SO ₂	10 tons per year	10 tons per year	
VOC	41 tons per year	65 tons per year	

[PSD]

Verification: See Condition **AQ-59** and its verification.

AQ-43 The maximum total dissolved solids (TDS) of the cooling tower blowdown water shall not exceed 5000 mg/liter. The owner/operator shall

sample and record the TDS content of the cooling tower blowdown water on a weekly basis or at a frequency consistent with that set by the Regional Water Quality Control Board if more stringent. The owner/operator shall maintain a log containing the date, the results of each test, and calculations of the mass emission rate of particulate matter from the cooling tower. [PSD]

Verification: See Condition **AQ-59** and its verification.

AQ-44 The PM_{10} emission rate for the wet cooling tower shall not exceed 37.5 pounds per day at a maximum circulation rate not to exceed 125,000 gallons per minute using the following method to determine compliance:

$$(\text{gallons of drift/minute}) \times (1 \text{ minute}/60 \text{ seconds}) \times (3.785 \text{ liters/gallon}) \times (\text{mg } PM_{10}/\text{liter}) \times (1 \text{ gram}/1000 \text{ milligrams}) = \text{grams } PM_{10}/\text{second}$$

$$(\text{grams } PM_{10}/\text{second}) \times (60 \text{ seconds/minute}) \times (60 \text{ minutes/hour}) \times (1 \text{ pound}/454 \text{ grams}) = \text{pounds } PM_{10}/\text{hour}$$

$$(\text{pounds } PM_{10}/\text{hour}) \times (24 \text{ hours/day}) = \text{pounds } PM_{10}/\text{day}$$

[PSD]

Verification: See Condition **AQ-59** and its verification.

AQ-45 Cooling towers shall be properly installed and maintained. The wet cooling towers shall be equipped with high efficiency mist eliminators with a minimum guaranteed drift rate of 0.0005%. The owner/operator shall provide drift eliminator vendor's justification and guarantee of the drift rate at least thirty days prior to installation. [PSD]

Verification: At least thirty days prior to installation, the project owner shall submit to the District and the CPM a copy of the performance guarantee letter from the cooling tower manufacturer.

AQ-46 A maintenance procedure shall be established that states how often and what procedures will be used to ensure the integrity of the drift eliminators. This procedure is to be kept on-site and be available to the District for review and approval. [PSD]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, EPA and/or the Commission.

AQ-47 No compounds containing hexavalent chromium shall be added to cooling tower's circulating water. The following information shall be provided:

- Owner/operator of the tower;
- Location of the tower;
- Cooling tower type and materials of construction;
- A description of the cooling water treatment program chosen, as well as the circulating water monitoring plan.

[Non-PSD]

Verification: At least ninety days before the tower is operated, the project owner shall provide the District, in writing, the information required in Condition **AQ-47**.

AQ-48 Emission testing for NO_x (reported as NO₂), CO, PM₁₀, VOC, and SO₂ emissions from each HRSG exhaust and emission calculations of the PM₁₀ emissions from the cooling tower shall be conducted annually by an independent testing firm(s) in strict compliance with the test methods specified in Condition **AQ-51** and the calculation method specified in Condition **AQ-44**. The cooling tower emission calculations shall be conducted by a licensed Cooling Tower Institute testing firm and shall include an evaluation of the operating efficiency of the drift eliminators in at least two cells. The Air Pollution Control Officer and the CEC CPM may approve the use of the NO_x and CO CEMs readings to quantify annual emissions in lieu of emission testing after the first five annual compliance test as provided by Condition **AQ-38** if annual relative accuracy procedures, consistent with the EPA Quality Assurance Guidelines, are completed as required by Condition **AQ-32** above. Results of all emission testing shall be forwarded to the District and the CEC CPM for compliance verification. An emission testing protocol detailing the methods of sampling and analysis shall be submitted to the District for approval 30 days prior to the initial testing and any subsequent test required under the above rule, and the District shall be notified at least ten days prior to the actual date of testing so that a District observer can be present. The following parameters shall also be determined during the emission testing:

- Natural gas consumption SCFH
- Electricity generated during the test
- Ammonia injected: lb/scf of natural gas burned; lb/hr
- Stack exhaust flow rate in dry standard cubic feet per minute
- Exhaust gas oxygen concentration, in percent
- Exhaust gas temperature in degrees Fahrenheit

- Exhaust gas moisture content
 - CO/VOC surrogate ratio.
- [PSD]

Verification: Forty five days after testing, the project owner shall provide the District and the CPM a copy of the source test results. All exemption from annual testing shall be requested in writing to the CPM and the APCO.

AQ-49 Emission testing of NO_x, CO, VOC, SO₂, and PM₁₀ during periods of cold startup, warm startup, hot startup, and shutdown for each HRSG exhaust shall be conducted at least once every five years commencing with the initial compliance test.

Verification: Forty five days after testing, the project owner shall provide the District and the CPM a copy of the source test results.

AQ-50 At least four sampling ports must be provided on each HRSG exhaust stack (located on the same horizontal plane, 90 degrees apart, and at least two [2] duct diameters downstream, and one-half [½] duct diameters upstream of any flow disturbance) and shall consist of 4-inch female NPT couplings welded to the stack. The couplings shall be supplied with 4-inch pipe plugs. Sampling platforms shall be installed on each stack. The location of the sampling ports and design of the platform must be approved by the District prior to installation.

Verification: At least 120 days before installation, the project owner shall submit to the District for approval and the CPM a plan for the installation of stack sampling ports and platforms.

AQ-51 The following test methods shall apply when testing for the specific pollutant is required unless EPA- approved alternative test methods have been authorized by the District:

Particulate Matter	CARB Method 5 (front and back half analysis)
Oxides of Nitrogen	EPA Method 20
Carbon Monoxide	EPA Method 10 or ARB Method 100
Sulfur dioxide	EPA Method 20
Reactive Organic Compounds	EPA Method 18
Ammonia	Bay Area AQMD Method ST-1B
Stack Gas Oxygen	EPA Method 20

[PSD]

Verification: Forty five days after testing, the project owner shall provide the District and the CPM a copy of the source test results. All exemption from annual testing shall be requested in writing to the CPM.

AQ-52 Within 60 days after startup, emission testing of each HRSG exhaust in accordance with methods specified in Condition **AQ-51** shall be performed to determine the mass emission rates and concentrations of NO_x, CO, VOC, SO₂, and PM₁₀ at 100 percent gas turbine load and ambient conditions and under the various startup and shutdown modes defined above in Condition **AQ-39**. The test results shall be corrected to ISO standard ambient conditions.

In addition, the initial compliance test shall include emission testing for the following chemical compounds using the specified testing methods for purposes of satisfying Condition **AQ-9**:

benzene	CARB Method 410
formaldehyde	CARB Method 430
acrolein	(<u>Note</u> : Source testing for acrolein should only occur after the CARB Monitoring & Laboratory Division) has provided a written recommendation for the method to be used for such testing. If there is no written recommendation at the time of the initial compliance test, the acrolein source test should be delayed until such recommendation is made.

[Non-PSD]

Verification: Forty five days after testing, the project owner shall provide the District and the CPM a copy of the source test results.

AQ-53 The SCR system shall include provisions for continuously monitoring and recording the amount of ammonia injected in pounds per hour, the SCR catalyst inlet temperature, pressure differential across the SCR catalyst, and be equipped with a control module that continuously adjusts the NH₃ injection rate to achieve the desired NO_x emission level. [PSD]

Verification: At least ninety days prior to the start of rough grading, the project owner shall submit to the District and the CPM for approval the final selection and design details of the gas turbines and associated equipment, including all proposed post combustion control systems.

AQ-54 Within 60 days after initial startup and annually thereafter within thirty (30) days prior to the renewal date of the Permit to Operate, the owner/operator shall conduct District-approved emission testing on each HRSG exhaust to determine compliance with the ammonia slip emission limit of Condition **AQ-38**. The test shall be in accordance with Bay Area AQMD Method ST-1B. The emission test shall determine the correlation between the heat input rates of the gas turbine and associated HRSG, SCR system ammonia injection rate, and the corresponding ammonia emission concentration at the HRSG exhaust.

The test shall be conducted over the expected operating range of the turbine. Continuing compliance with the ammonia slip emission limit of Condition **AQ-38** shall be demonstrated daily through calculations of corrected ammonia concentrations based upon the source test heat input correlation and continuous records of ammonia injection rates. [PSD]

Verification: Forty five days after testing, the project owner shall provide the District and the CPM a copy of the source test results.

AQ-55 The selective catalytic reduction (SCR) system shall be activated and ammonia shall be injected whenever the SCR has reached or exceeded 500°F except for periods of equipment malfunction. Except during periods of startup, shutdown, and malfunction, ammonia slip shall not exceed 5 ppmvd at 15% O₂. [PSD]

Verification: See Condition **AQ-59** and its verification.

AQ-56 To demonstrate compliance with the mass emission limitations for NO_x, CO, PM₁₀, SO_x, VOC, and NH₃ stated in conditions stated in Conditions **AQ-38**, **40**, **41**, and **42** above, the owner/operator shall calculate and record the hourly, daily, and year-to-date mass emissions (including initial commissioning and startup and shutdown emissions) from each power train using CEM emission data (for NO_x and CO) and emission factors derived from the most recent annual emission test (for PM₁₀, VOC, NH₃ and SO_x). The owner/operator shall use the actual heat input rates, actual gas turbine startup times, actual gas turbine shutdown times, and CEC and District-approved emission factors developed during the emission testing required by Conditions **AQ-52** and **54** to calculate these emissions.

The daily emissions from the cooling tower shall be calculated using the method specified in Condition **AQ-44**. [PSD]

Verification: See Condition **AQ-59** and its verification.

AQ-57 The duct burners shall not be operated unless the associated combustion gas turbines, oxidation catalyst, and SCR system is in operation.

Verification: See Condition **AQ-59** and its verification.

AQ-58 Exhaust stack heights of the HRSG's shall not exceed 150 feet above grade level at the stack base.

Verification: At least 45 days prior to the release to the manufacturer of the emission stack's "approved for construction" drawings, the project owner shall

submit the drawings to the District and the CPM for approval.

AQ-59 Monthly emission reports shall be submitted by the 15th of the month following data recording and shall include:

- all periods 3 minutes and longer in duration when opacity from either HRSG exhaust stack or any oil mist eliminator exceeds the specified limits and the reason for the excursion;
 - all periods when NO_x, CO, VOC, PM₁₀, SO_x, or NH₃ emission from the exhaust stacks exceed the specified limits and the reason for the excursion;
 - all periods the NO_x, or CO CEMs for the HRSGs exhaust were not functioning and the reasons for the same;
 - documentation of the quarterly calibrations of the monitoring devices required in Condition **AQ-32** and a report of corrective maintenance required as a result of the calibrations;
 - documentation of daily and monthly emissions of PM₁₀, NO_x, CO, SO_x, and VOC from the HRSG exhausts and the cooling tower using the methods specified in Conditions **AQ-44** and **56**;
 - documentation of monthly natural gas fuel consumption for the gas turbines and duct burners;
 - documentation of fuel sulfur content through monthly reports from natural gas supplier;
 - documentation of the date and times when the temperature in the SCR is less than 500°F or less than the design temperature of the catalyst;
 - documentation of total operation time, date and time at the beginning and end of each startup/shutdown period, hours in cold startup, hours in warm startup, hours in hot startup, and hours in shutdown periods for each power train;
 - documentation of quantity of electricity generated on a daily basis and total for the month;
 - documentation of corrective action taken to correct each event of malfunctioning operating or emission control equipment or any condition causing excessive emissions;
 - if no permit limitations were exceeded, the report must so state.
- [PSD]

Verification: The project owner shall submit to the District and the CPM the above information for the preceding calendar month by the 15th of the following month. This information shall be maintained on site for a minimum of five years and shall be provided to District, EPA and CEC personnel on request.

AQ-60 Drawings and design details of the continuous emission monitoring equipment, data acquisition systems, SCR system, and oxidation catalyst shall

be submitted to the District for approval prior to purchasing such equipment. [PSD]

Verification: At least ninety days prior to the start of rough grading, the project owner shall submit to the District and the CPM for approval the final selection and design details of the gas turbines and associated equipment, including all proposed post combustion control systems.

AQ-61 Fugitive dust emissions from unpaved roads or any other area without vegetative cover shall be controlled at all times such that a violation of an ambient air standard or a public nuisance is not created at any point beyond the plant property line. [PSD]

Verification: See verification for Condition **AQ-29**.

AQ-62 Solid wastes from the softener filter press and the crystallizer filter press shall be removed from the site continuously or stored in containers having a cover. All solid wastes from the subject presses shall be transported offsite in a wet condition in covered containers at all times unless transported in dry form in a totally sealed container. It shall be the responsibility of the facility owner/operator to insure that any and all contracts or company carriers adhere to this condition. [Non-PSD]

Verification: See Condition **WASTE-3**.

B. PUBLIC HEALTH

The public health analysis supplements the previous discussion on air quality and looks at potential public health effects from project emissions of toxic air contaminants. In this analysis, the Commission considers whether such emissions will result in significant adverse public health impacts that violate standards for public health protection.³³

SUMMARY AND DISCUSSION OF THE EVIDENCE

Operating the proposed Three Mountain Power Project (TMPP) would create combustion products and possibly expose workers and the general public to these pollutants as well as the toxic chemicals associated with other aspects of facility operations. The purpose of this public health analysis is to determine whether a significant health risk would result from public exposure to these chemicals and combustion by-products routinely emitted during project operations.

The exposure of primary concern in this section is to pollutants for which no air quality standards have been established. These are known as non-criteria pollutants, toxic air pollutants, or air toxics. Those for which ambient air quality standards have been established are known as criteria pollutants. These criteria pollutants are identified in this section (along with regulations for their control) because of their usually significant contribution to the total pollutant exposure in any given area. Furthermore, the same control technologies may be effective for controlling both types of pollutants when emitted from the same source.

³³ This Decision addresses other potential public health concerns in the following sections. The accidental release of hazardous materials is discussed in Hazardous Materials Management and Worker Safety and Fire Protection section. Electromagnetic fields are discussed in the section on Transmission Line Safety and Nuisance. Potential impacts to soils and surface water sources are discussed in the Soils and Water Resources section. Hazardous and non-hazardous wastes are described in the Waste Management section.

Compliance with the required control technologies is discussed in the **Air Quality** section. When a project is proposed for an area with existing violations of any of the air quality standards, the health impacts of the criteria pollutant in question is addressed in this section to assess the need for additional mitigation. (Ex. 64, p. 111.)

Project construction and operation will result in routine emissions of toxic air contaminants (TACs). These substances are categorized as noncriteria pollutants because there are no ambient air quality standards established to regulate their emissions. In the absence of standards, state and federal regulatory programs have developed a health risk assessment procedure to evaluate potential health effects from TAC emissions.³⁴ The Air Toxics “Hot Spots” Information and Assessment Act requires the quantification of TACs from specified facilities that are categorized according to their emissions levels and proximity to sensitive receptors. (Health and Safety Code, § 44360 et seq.)

1. Health Risk Assessment

Applicant performed a health risk assessment that was reviewed by Staff and the Shasta County Air Quality Management District (SCAQMD or Air District). Applicant’s risk assessment employed scientifically accepted methodology that is consistent with the CAPCOA Guidelines and with methods developed by the California Office of Environmental Health Hazard Assessment (OEHHA). (Ex. 1, § 6.9.2.1 et seq. and Applicant’s Testimony on Public Health dated February 2, 2000, p. 3, incorporated into Ex. 66, Testimony on Public Health, p. 1; Ex. 64, pp. 114-115.) Staff also made an independent analysis. (Ex. 64, pp. 116-117.) This approach emphasizes a worst-case “screening” analysis to evaluate the

³⁴ The health risk assessment protocol is set forth in the Air Toxics “Hot Spot” Program Risk Assessment Guidelines developed by the California Air Pollution Control Officers Association (CAPCOA) pursuant to the Air Toxics “Hot Spots” Information and Assessment Act (Health and Safety Code, § 44360 et seq.). (Ex. 1, § 6.9.2.1; Ex. 64, p. 115.)

highest level of potential impact. The following steps were included in this analysis:

- estimate emissions of toxic air contaminants from sources operating at the Facility;
- evaluate toxicity of toxic air contaminants to develop significance thresholds;
- conduct dispersion modeling to estimate downwind concentrations of toxic air contaminants; and
- conduct health risk calculations to estimate potential excess cancer and noncancer risks associated with exposure to the predicted concentrations of toxic air contaminants. (Ex. 1, § 6.9.2.1.)

Any non-criteria pollutant-related impacts from this type of project would be mainly associated with its emissions from the combustion turbines, ammonia from the selective catalytic reduction (SCR) system, and toxic chemicals from the cooling towers. For criteria pollutants, the impacts of most significance would result from emissions from the turbines. Potential public exposure to the surrounding population is estimated through air dispersion modeling. After estimating the exposure levels, staff assessed whether these exposure estimates are below the applicable air quality standards or reference exposure levels in the case of noncancer effects. For non-criteria pollutants, staff compared the potential for exposure to levels whose related cancer risks are considered significant by regulatory agencies. The procedure for evaluating the potential for these cancer and non cancer health effects is known as a health risk assessment process and consists of the following steps:

- A hazard identification step in which each pollutant of concern is identified along health effects it can cause;
- A dose-response assessment step in which the relation between the magnitude of exposure and the probability of effects is established;
- An exposure assessment step in which the possible extent of pollutant exposures from a project is established for all possible pathways by dispersion modeling; and

- A risk characterization step in which the nature and often the magnitude of the possible human health risk is assessed and presented. (Ex. 64, p. 113.)

Health risks associated with a project can result from high-level exposure, which creates immediate-onset (acute) effects, or from prolonged low-level exposure, which creates chronic effects. Since noncancer effects are assumed to result after exposure above specific thresholds, an analysis of the potential for these effects includes, where possible, consideration of background levels of those toxic pollutants. Such background measurements are not usually available for the non-criteria pollutants associated with natural gas combustion unless there are major sources in the area. Non criteria pollutants from combustion are generally emitted at relatively low levels compared to criteria pollutants. Background concentrations of non-criteria pollutants are normally encountered at lower levels than criteria pollutants. Given the project area's compliance with all federal air quality standards (with the noted exception of the state's PM₁₀ standard in the winter months), Staff did not expect the non-criteria pollutants to be encountered at significant background levels. Therefore, Staff assessed the potential impacts of the project's toxic emissions only in terms of their direct emission levels without requiring measurements of background levels. The potential for significant PM₁₀ impacts was also assessed. (Ex. 64, pp. 113-114.)

For natural gas-burning facilities such as the proposed TMPP, high-level exposure to toxic pollutants (which could cause acute effects) could occur only during major accidents and are not expected from routine operations when emissions are much lower. (See the **Hazardous Materials Management** section of this Decision.) For criteria pollutants (such as PM₁₀ in this case) which may be encountered at background levels high enough to violate their air quality standards, acute health impacts could result from any additions from the project. Long-term exposures could lead to chronic effects which the ambient air quality standard were established to prevent. Since acute impacts are not expected from exposure to the non-criteria pollutants from TMPP and similar sources,

effects of long-term, exposures are of greater concern than short-term effects in assessing the project's potential for public health impacts. Chronic effects from non-criteria pollutant exposures may be related to cancer or health effects other than cancer. (Ex. 64, p. 114.)

The method used by regulatory agencies to assess the significance of non cancer health effects of criteria and non criteria pollutants is the hazard index method and is used to assess both acute and chronic effects. In this method, a hazard index is calculated for the individual non-criteria pollutants by dividing projected exposure by the reference level for that pollutant. For the criteria pollutant, this hazard index value is obtained by dividing exposure levels by the applicable air quality standard. A hazard index of 1.0 or less suggests that acute or chronic effects would be unlikely. A value of more than 1.0 would point to the possibility of effects, but given the conservatism in the derivation process, is not regarded as definite evidence that such effects would occur. The indices for all pollutants are then added together to obtain an aggregate hazard index value for the project in question. A total index of 1.0 or less indicates a lack of potential effects from all pollutant exposures considered together. As with the individual pollutants, a value of more than 1.0 indicates that a more refined analysis is required to determine whether the project would pose an actual health risk, which might require mitigation. (Ex. 64, p. 114.)

Cancer from carcinogenic exposure usually results from biological effects at the molecular level. Since such effects are currently assumed possible from every exposure to a carcinogen, the risk of cancer is generally considered by this Commission and other regulatory agencies as more sensitive than the risk of non cancer health effects. This accounts for the prominence of theoretical cancer risk estimates in the environmental risk assessment process. For any source of concern, the potential risk of cancer is obtained by multiplying the exposure estimate by the potency values for the individual carcinogens involved. The total project-related cancer risk is then obtained by adding together the risk values

obtained for each of the individual carcinogens. This assessment process allows for calculation of only the upper bounds on the cancer risk. The actual risk will likely be lower and could indeed be zero. (Ex. 64, pp. 114-115.)

Various state and federal agencies specify different cancer risk levels as levels of significance with regard to specific sources. For example, a risk of 10 in a million is considered significant under the Air Toxics “Hot Spots” and the Proposition 65 programs, and is used as a threshold for public notification in cases of air toxics emissions from existing sources. For sources in California, all these risk values are calculated using the conservative guidelines in the CAPCOA guidelines. Staff considers a potential cancer risk of one in a million as the *de minimis* level, which is the level below which the related exposure is negligible, meaning that project operation is not expected to result in any increase in cancer. Above this level, further mitigation could be recommended after proper consideration of issues related to the limitations of the assessment process. For non-carcinogenic pollutants, Staff will consider significant health impacts unlikely when the hazard index estimate is 1.0 or less. If more than 1.0, staff would regard the related emissions as potentially significant from an environmental health perspective. (Ex. 64, p. 115.)

2. Potential Impacts

The proposed facility will be located within a 40-acre site surrounded by land zoned for industrial use, rural residential use and timberland. This location is 1 mile away from the town of Burney in Shasta County, with a population of 3,500. The nearest residence to the site is approximately 1,400 feet away. The air quality in the Burney area is considered good since its air pollutant levels do not exceed federal air quality standards. However, as noted in the Air Quality section, the area exceeds the state’s PM₁₀ standards in the winter months mainly because of the use of wood-burning stoves and fireplaces. While it is appropriate to continue including the area’s industrial sources in the search for

solutions to the area's PM₁₀ problem, Staff considers a control program with respect to wood stove and fireplace emissions to be as significant as the one for these industrial sources. A detailed mitigation plan was provided by Applicant in this regard (Attached as Ex. 3 to Ex. 66, Project Description Testimony) and it was found acceptable by Staff. Among other things, this plan is intended to offset the project's PM₁₀ emissions by reducing the contribution from area wood-burning stoves and fireplaces. Ex. 64, pp. 112-113.)

Applicant included a listing of locations with sensitive receptors, such as children and the elderly, within a 6-mile radius of the facility. (Ex. 1, § 6.9.2.3.3, Table 6.9-3.) That listing is reproduced below. These sensitive receptors are usually more susceptible than the general population to the effects of environmental pollutants. Extra consideration is given to possible effects of exposure to these individuals in establishing exposure limits for environmental pollutants. Most of the area to be impacted by the project's pollutants is timberland.

**Table 6.9-3
LISTING OF POTENTIAL SENSITIVE RECEPTORS**

Receptor	Address
Mountain Christian Academy	State Route 299 and Cassel Road
Mountain View High School	20375 Tamarack Road
Burney Jr./Senior High School	37571 Mountain View Road
East Burney Elementary School	37403 Toronto
Pit River Health Services	36977 Park
Head Start	38234 Main, Johnson Park
Intermountain Family Practice Group	20641 Commerce Day

These sensitive receptors were modeled as discrete receptors in a separate ISCST3 model run to evaluate the potential for public health impacts associated with exposure to emissions of toxic air contaminants from the Three Mountain Power Facility. (*Ibid.*)

Construction. Potential risks to public health during construction may be associated with toxic substances disturbed during site preparation, and emissions from heavy equipment as noted for the project. (Ex. 1, § 6.9.2.2.) Potential impacts from emission of criteria pollutants from heavy equipment operation and particulates from site preparation are assessed in the **Air Quality** section of this Decision. The **Air Quality** section also addresses compliance with applicable emission-limiting District rules together with the requisite conditions of certification. Since no hazardous substances were identified from the Environmental Site Assessment (ESA) for the project (Ex. 1, § 6.12.1), no significant pollutant-related public health impacts are anticipated from the relatively short-term construction-related earth moving activities involved. Effects from chronic exposures are not expected from these short-term activities. (Ex. 1, § 6.9.2.2; Ex. 64, p. 115.)

As described above and in the **Waste Management** section of this Decision, the Phase I ESA reported no evidence of significant site contamination. Therefore, no significant toxics-related public health impacts are anticipated from earth moving due to project construction. The procedures for minimizing dust exposure are addressed in the **Air Quality** section of this Decision. Construction worker safety measures are incorporated in the **Worker Safety** section of this Decision.

Operation. As discussed, above, Applicant conducted the health risk assessment for the project-related emissions of potential significance according to procedures specified in the CAPCOA guidelines for sources of this type. Results and assumptions of this assessment were provided to Staff and the other parties. (See generally, Ex. 1, §§ 6.9.2.3.1-6.9.2.4.)

Staff has found Applicant's assumptions to be generally accurate and concurred with Applicant's findings with regard to the numerical public health risk estimates expressed either in terms of the hazard index for each non carcinogenic pollutant, or a cancer risk for estimated levels of the carcinogenic pollutants.

These analyses were conducted to determine the potential for acute and chronic effects on body systems such as the liver, central nervous system, the immune system, kidneys, the reproductive system, the skin and the respiratory system. (Ex. 64, p. 116.)

The following non-criteria pollutants were considered for potential to produce non-cancer effects: ammonia, acetaldehyde, acrolein, benzene, 1,3 butadiene; formaldehyde, naphthalene, toluene, xylenes, propylene oxide and polycyclic aromatic hydrocarbons (PAHs). Of the criteria pollutants, only PM₁₀ was considered as creating a potential for impacts in the problem winter months when, as more fully discussed in the **Air Quality** section of this Decision, violations are related to air inversions in the project area. The highest measured background concentration was specified as 91 µg/m³. The following were considered with regard to a possible cancer risk: acetaldehyde, benzene, 1,3 butadiene, formaldehyde, PAHs and propylene oxide. (*Ibid.*)

A hazard index value of 0.080 was calculated for combined chronic health effects of the non-criteria pollutants for the individual at the maximum impact location approximately 2.5 miles in an unpopulated area south of the site boundary. A value of 0.0385 was calculated for combined acute health effects for an individual at the maximum impact location approximately 2.2 miles in an unpopulated area north-northwest of the facility. These values are significantly below the 1.0 significance level suggesting that significant non-cancer health effects would be unlikely during operations with respect to non-criteria pollutants. A background hazard index of 1.82 was calculated for PM₁₀, pointing to the need to prevent further additions in the problem winter periods at issue. It is for this that specific mitigation measures are recommended in the **Air Quality** section of this Decision. (Ex. 64, pp. 116-117.)

The highest combined cancer risk was estimated to be 0.69 in a million for an individual at the same location identified for the total hazard index for chronic

effects. This risk was calculated using existing procedures, which assume that the individual will be exposed at the highest possible levels to all the carcinogenic pollutants from the project for 70 years. This risk value is much below staff's *de minimis* level. (Ex. 64, p. 117.)

BRG insists that Applicant's risk analysis should have added the Project's acute hazard index to the acute hazard index associated with background concentrations of criteria pollutants. BRG also asserts that Staff improperly relied upon an *estimated* acute hazard index value projected for the Project that was below the significance threshold of 0.5. (12/18 RT 137-138.) The expert witnesses for both Staff and Applicant agreed that the acute hazard index calculated for the Project complies with applicable risk assessment guidelines. (Ex. 64, pp. 116-117; 12/18 RT 137-139.) TMPP experts recalculated the acute hazard index to reflect the Office of Environmental Health Hazard Assessment's new acute reference exposure levels. Staff did not calculate a separate acute hazard index but evaluated the applicant's calculated values including assessing compliance with well-characterized modeling approaches approved by staff for Three Mountain and similar projects. (Ex. 72, p. 1.) This is standard practice throughout the State when determining the significance of public health impacts and requirements for public notification and implementation of risk reduction measures. Staff based its conclusions upon the recalculated index for the Project and concluded that the Project complies with applicable requirements. (12/18 RT 138.) Details of the modeling exercise were provided to staff for validation. Given the uncertainties in the underlying evaluative process, Staff considered Applicant's estimated acute index value of 0.0385 adequately representative of the potential for the acute health effects at issue. Staff testified that CURE's calculated value of 0.5624³⁵ (which CURE noted to be mainly related to the effects of acrolein) is a demonstrable overestimation deriving from

³⁵ This figure was never the product of direct testimony in this proceeding at least in part because CURE was not a participant in the evidentiary hearings on Public Health. This figure, however, was adopted by BRG.

CURE's presently unique adjustments to correct for what they regard as errors in how acrolein-related health risks are presently assessed and that CURE's approach has not been approved by any of the California state agencies responsible for the accuracy of existing assessment guidelines.³⁶ (Ex. 72, pp. 1-2.)

3. Cumulative Impacts

When toxic pollutants are emitted from multiple sources within a given area, the cumulative, or additive, impacts of such emissions could, in concept, lead to significant health impacts within the population, even when such pollutants are emitted at insignificant levels from the individual sources involved. Analyses of such emissions have shown, however, that the peak impacts of such toxic pollutants are normally localized within relatively short distances from the source. Toxic pollutant emission levels beyond the point of maximum impact normally fall within background levels. Potentially significant cumulative impacts are only expected in situations where new sources are located adjacent to one another. Since no significant pollutant sources are presently proposed for the TMPP's impact area, no exposures of a cumulative nature are expected for the area. (Ex. 64, p. 118.)

FINDINGS AND CONCLUSIONS

Based on the uncontroverted evidence of record, the Commission makes the following Findings and Conclusions:

1. Normal operation of the Three Mountain Power Project (TMPP) will result in the routine release of criteria and noncriteria pollutants that have the potential to adversely impact public health.

³⁶ By agreement between the parties, Staff's expert, Obed Odoemelam, was cross-examined by BRG by way of written question and answers. (See Ex. 72.) Those questions and answers rebut the position taken by BRG and eliminate the need for further discussion here. We adopt those answers as correctly stating the law on the subject.

2. Emissions of criteria pollutants, which are discussed in the Air Quality section of this Decision, will be mitigated to levels consistent with applicable standards.
3. Applicant performed a health risk assessment, using well-established scientific protocol, to analyze potential adverse health effects of noncriteria pollutants emitted by TMPP.
4. The sensitive receptors within a six-mile radius of the project site are listed in this Decision and they will incur no significant impact as a result of the operation of TMPP.
5. Acute and chronic non-cancer health risks from project emissions during construction and operational activities are insignificant.
6. The potential risk of cancer from project emissions is insignificant.
7. There is no evidence of cumulative public health impacts from project emissions.

The Commission therefore concludes that with implementation of the Condition of Certification adopted in the **Air Quality** section of this Decision, project emissions of noncriteria pollutants do not pose a significant direct, indirect, or cumulative adverse public health risk and the Three Mountain Power Project will conform with all applicable laws, ordinances, regulations, and standards relating to air quality as set forth in the pertinent portions of Appendix A of this Decision. No other Conditions of Certification to control project emissions are required in addition to those specified in the **Air Quality** section of this Decision.

C. WORKER SAFETY AND FIRE PROTECTION

Industrial workers are exposed to potential health and safety hazards on a daily basis. This analysis reviews whether Applicant's proposed health and safety plans are designed to protect industrial workers and provide adequate fire protection and emergency service response in accordance with all applicable laws, ordinances, regulations, and standards (LORS).

SUMMARY OF THE EVIDENCE

1. Potential Impacts to Worker Safety

Industrial environments are potentially hazardous, both during the construction and operation of facilities. Workers at the proposed TMPP may be exposed to loud noises, electrocution, chemical spills, hazardous waste, fires, explosions, moving equipment, falling equipment or structures, trenches, confined space entry and egress hazard problems; and may experience falls, trips, burns, lacerations and numerous other injuries. (Ex. 56, p. 36.) It is important for the applicant to have well-defined policies, procedures, training, hazard recognition and control at their facility to minimize such hazards and to protect workers. The applicant has provided adequate outlines of their proposed worker safety plans that will be expanded prior to construction and operation of the project, as required by conditions of certification **SAFETY-1** and **SAFETY-2**.

TMPP presents no unusual features that would require special mitigation measures in addition to those established in the applicable LORS.³⁷ (Ex. 56, pp. 33 and 41.)

³⁷ California Occupational Health and Safety Administration (Cal/OSHA) regulations (Cal. Code of Regs., tit. 8, § 1500 et seq.) and other applicable federal, state, and local laws affecting industrial workers are identified in Appendix A of this Decision. See also, Ex. 56, pp. 33-35.

2. Fire Protection

The two fire departments that will provide services for the proposed project are the Burney Fire Protection District (District), and the Shasta County Fire Department, which is administered by the California Division of Forestry (CDF). The District will be the first responder to structural fires associated with the power plant and related electric transmission and gas pipelines. Its closest station in Burney has a 5 to 10 minute response time to the proposed facility location. The District has three full-time firefighters and from 20 to 25 volunteer firefighters; five fire fighting engines, with pumping capacities ranging from 400 to 1,250 gallons per minute, and can call for support from surrounding fire departments. The District's extension ladders are, however, limited to thirty-five feet, which are inadequate for reaching the upper levels of the proposed facilities. (Ex. 56, p. 35; Ex. 21, pp. 2-3; Ex. 1, § 6.11.1.3.6.)

During the fire season from May through October the CDF's staff and equipment is located in Johnson Park, just east of Burney, and is responsible for responding to wildland fires that could occur in the areas adjacent to the project facilities, including the power plant site and the electric transmission line. At other times of the year, CDF will be located in Redding. The next closest fire department available to respond is the Cassel Volunteer Fire Department, located 12 miles from Burney. (Ex. 56, p. 35.)

To determine the project's impacts on fire protection, Staff reviewed the information provided in the AFC regarding available fire protection services and equipment, which are intended to limit personnel injury and property loss. (Ex. 1, § 6.11.1.3.5.) The project will include the following fire protection components: a fire water system, including storage, piping and pumps, fire hydrants and sprinkler systems, a carbon dioxide fire protection system, fire detection sensors, and portable fire extinguishers. The applicant will be required to provide final

diagrams and plans to Staff and the District, prior to construction and operation of the project, to confirm the adequacy of these fire protection measures.

The TMPP will also be supported by local fire protection services, as described above. The District has evaluated the potential impacts of the proposed project on their service capabilities. In a letter to the Commission staff, dated 11/22/99, the District identified the need for Applicant to undertake the following:

- Purchase one ladder truck with one hundred foot platform; and three Macaw backpacks.
- Provide training for personnel on hazardous materials handling and for personnel on ladder truck

The one hundred foot-platform (ladder) truck would be used to reach the upper levels of the project facilities at the plant site. The backpacks would be used during small fires in the grass or in the hazardous materials storage areas. (Ex. 56, p. 36.)

Title 8, California Code of Regulations, section 3221 requires a Fire Protection Plan. The AFC contains an outline of a fire protection and prevention plan that is adequate for Staff's analysis. The outline includes the appropriate components, including, training, fire control and emergency response, alarm systems, fire fighting equipment, and materials storage and disposal procedures.

Staff proposes that the Applicant submit a Construction Fire Protection and Prevention Plan and an Operation Fire Protection Plan to the California Energy Commission Compliance Project Manager (CPM) and the District for review and acceptance to satisfy proposed Conditions of Certification **SAFETY-1 and SAFETY-2.**

The Three Mountain Power Site will become the fire protection responsibility of the Burney Fire Protection District. As such, fire suppression systems will be subject to review and approval by the Burney Fire Protection District.

The Burney Fire Protection District, in conjunction with the Shasta County Fire Department, will perform the final inspection of the Three Mountain Power Site when construction is complete. Periodic fire and life safety inspections, including reviewing and approving programs for regular equipment inspections and servicing, will be provided by the Burney Fire Protection District. In addition, the Project's insurance carrier will provide annual inspections by a fire protection specialist. Servicing of the fixed CO₂ systems will be conducted by a licensed contractor. (Ex. 21, p. 2.)

Hazardous material response will be available from the Shasta County Fire Department, located in Redding, by approximately June 2000.³⁸ At that time, the hazardous material response team will be a minimal operational unit for response up to personal protective level B. A target date of the year 2000 was established for the hazardous materials response team to be fully operational. This team will not be trained to perform confined space rescue. In addition, the Butte County Fire Department is currently available for hazardous material response with a fully operational team. However, their activation time is 4 hours and the team could serve as a backup to the Shasta County Fire Department. (Ex. 21, pp. 2-3.)

³⁸ This was estimated at the time of the Evidentiary Hearings in March 2000. The evidentiary record does not contain any updates on this information. We assume these target dates will be met at least by the start of construction.

In addition to incorporating various safety and environmental features and design measures to minimize emergencies and their effects on public and worker safety, the Facility will have a site-specific Emergency Action Plan. The Emergency Action Plan addresses potential emergencies, including chemical releases, fires, bomb threats, pressure vessel ruptures, aqueous ammonia releases, and other catastrophic events. It describes evacuation routes, alarm systems, points of contact, assembly areas, responsibilities, and other actions to be taken in the event of an emergency. The plan has a layout map and a fire extinguishers list, and describes arrangements with local emergency response agencies for responding to emergencies. (Ex. 21, p. 2.)

3. Mitigation Measures

As mitigation for the impacts to fire protection services, as described above, the District and the Applicant are engaged in ongoing discussions regarding the funding of the equipment and training needs identified by the District. The District also intends to request support from the existing industrial facilities to fund the equipment and training needs. (Ex. 56, p. 36; see also Ex. 42.) In the **Socioeconomics** section of this decision, Condition of Certification **SOCIO-2** is included to assure that the applicant provides their share of funding of the District's identified needs.

COMMISSION DISCUSSION

Implementation of the Construction Safety and Health Plan and the proposed Operation Safety and Health Plan will ensure compliance with applicable LORS relating to industrial workers and will reduce potential impacts to insignificant levels. If the applicant provides a Construction Safety and Health Plan, and an Operation Safety and Health Plan, as required by Conditions of Certification **SAFETY-1** and **SAFETY-2**; and provides the funding required by Conditions of Certification **SOCIO-2**, the project will incorporate sufficient measures to ensure

adequate levels of industrial safety and fire protection, and comply with applicable LORS.

The proposed Conditions of Certification provide assurance that the Project Construction and Operation Safety and Health Programs proposed by the applicant will be reviewed by the appropriate agencies before implementation. The Conditions also require verification that the proposed plans adequately assure worker safety and fire protection and comply with applicable LORS.

FINDINGS AND CONCLUSIONS

Based on the evidence of record, the Commission makes the following Findings and Conclusions:

1. Industrial workers are exposed to potential health and safety hazards on a daily basis.
2. To protect workers from job-related injuries and illnesses, the project owner will implement comprehensive Safety and Health Programs for both the construction and operation phases of the project, including an accident/injury prevention program, a personal protective equipment program, an emergency action plan, a fire protection and prevention plan, and other general safety procedures.
3. The project will rely on local fire protection services and onsite fire protection systems that will be approved by the Burney Fire Protection District.
4. The Burney Fire Protection District has one fire station within 5 to 10 minutes response time to the project site.
5. HAZMAT first response can be provided by the Shasta County Fire Department Personnel.
6. Existing fire and emergency service resources will be adequate to meet project needs with the completion of discussions between TMPP and the Burney Fire Protection District to ascertain the funding and measures necessary to ensure adequate fire protection and emergency services.

7. With the agreement between TMPP and the Burney Fire Protection District regarding appropriate funding/mitigation, impacts to fire protection and emergency services will be insignificant.

Implementation of the Conditions of Certification, below, will ensure that the project conforms with all applicable laws, ordinances, regulations, and standards on industrial worker health and safety as identified in the pertinent portions of APPENDIX A of this Decision. The Commission therefore concludes that implementation of Applicant's Safety and Health Programs and Fire Protection measures will reduce potential adverse impacts on the health and safety of industrial workers to levels of insignificance.

CONDITIONS OF CERTIFICATION

SAFETY-1 The project owner shall submit to the CPM a Project Construction Safety and Health Program, which shall include:

- A Construction Injury and Illness Prevention Program.
- A Construction Fire Protection and Prevention Plan.
- A Personal Protective Equipment Program.

Protocol: The Construction Injury and Illness Prevention Program and the Personal Protective Equipment Program shall be submitted to the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders.

The Construction Fire Protection and Prevention Plan shall be submitted to the Burney Fire Protection District for review and acceptance.

Verification: Thirty days prior to the start of construction, or a lesser period of time as mutually agreed to by the project owner and the CPM, the project owner shall submit to the CPM a copy of the Project Construction Safety and Health Program and the Personal Protective Equipment Program, with a copy of the cover letter of transmittal of the plan to CAL-OSHA. The project owner shall provide a letter from the Burney Fire Protection District stating that they have reviewed and accept the Construction Fire Protection and Prevention Plan.

SAFETY-2 The project owner shall submit to the CPM a Project Operation Safety and Health Program containing the following:

- An Operation Injury and Illness Prevention Plan;
- An Emergency Action Plan;
- An Operation Fire Protection Plan; and
- A Personal Protective Equipment Program.

Protocol: The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the Cal/OSHA Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders.

Protocol: The Operation Fire Protection Plan and the Emergency Action Plan shall be submitted to the Burney Fire Protection District for review and acceptance.

Verification: At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the final version of the Project Operation Safety & Health Program. It shall incorporate Cal/OSHA's Consultation Service comments, stating that they have reviewed and accepted the specified elements of the proposed Operation Safety and Health Plan.

The project owner shall notify the CPM that the Project Operation Safety and Health Program (Injury and Illness Prevention Plan, Fire Protection Plan, the Emergency Action Plan, and Personal Protective Equipment requirements), including all records and files on accidents and incidents, is present on-site and available for inspection.

SAFETY-3 The project owner shall design and install all exterior lighting to meet the requirements contained in the Visual Resources conditions of certification and in accordance with the American National Standards Practice for Industrial Lighting, ANSI/IES-RP-7.

Verification: Within 60 days after construction is completed, the project owner shall submit a statement to the CPM that the illuminance levels contained in ANSI/IES RP-7 were used as a basis for the design and installation of the exterior lighting.

D. HAZARDOUS MATERIALS MANAGEMENT

This analysis considers whether the construction and operation of the Three Mountain Power Project (TMPP) will create significant impacts to public health and safety resulting from the use, handling, or storage of hazardous materials at the facility. Related issues are addressed in the **Waste Management, Worker Safety, and Traffic and Transportation** portions of this Decision.

SUMMARY AND DISCUSSION OF THE EVIDENCE

Several locational factors affect the potential for project-related hazardous materials to cause adverse impacts, including local meteorological conditions, terrain characteristics, any special site factors, and the proximity of population centers and sensitive receptors. The evidence of record incorporates these factors in the analysis of potential impacts.

1. Potential Impacts

The only Acutely Hazardous Material proposed for use at the TMPP in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j), is aqueous ammonia. The use of aqueous ammonia eliminates the high internal energy associated with the more hazardous anhydrous form, which is stored as a liquefied gas at high pressure. An accidental release of aqueous ammonia is less violent and easier to contain than anhydrous ammonia, which can rapidly introduce large quantities of the material to the ambient air, where it can be transported in the atmosphere and result in high down-wind concentrations. The emission rate from a release of aqueous ammonia is limited by mass transfer from the free surface of the spilled material, hence a reduction in the rate of emission to the atmosphere. (Ex. 56, p. 57.)

Other hazardous materials stored in smaller quantities, such as mineral and lubricating oils, corrosion inhibitors, water conditioners and hydrogen, will be present at the

proposed facility. (Ex. 1, §§ 6.10.2.1, 6.10.2.2; Ex. 9, p. 2) However, these materials pose no significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, and/or their environmental mobility. (Ex. 56, p. 57.)

Although no natural gas is stored, the project will also involve the construction and operation of a natural gas pipeline and handling of large amounts of natural gas. (Ex. 1, § 6.10.2.2.1) Natural gas poses some risk of both fire and explosion. (Ex. 56, pp. 57-58.) Issues regarding the natural gas pipeline are addressed in the **Facility Design** portion of this Decision.

TMPP will also require the transportation of aqueous ammonia to the facility. (Ex. 56, p. 58.) The analysis of the transportation of aqueous ammonia is addressed in the **Traffic and Transportation** portion of this Decision.

a. Aqueous Ammonia

Aqueous ammonia will be used in controlling the emission of oxides of nitrogen (NOx) from the combustion of natural gas in the facility. The accidental release of aqueous ammonia without proper mitigation can result in hazardous down-wind concentrations of ammonia gas.

To assess the potential impacts associated with an accidental release of ammonia, staff typically evaluates where four “bench mark” exposure levels of ammonia gas occur off-site. These are:

- the lowest concentration posing a risk of lethality, 2,000 ppm;
- the Immediately Dangerous to Life and Health (IDLH) level of 300 ppm;
- the Emergency Response Planning Guideline (ERPG) level 2 of 200 ppm, which is also the RMP level 1 criterion used by EPA and California; and
- the level considered by the Energy Commission staff to be without serious adverse effects on the public for a one-time exposure of 75 ppm. (Ex. 56, pp. 60-61.)

If the exposure associated with a potential release would exceed 75 ppm at any public receptor, a presumption exists that the potential release poses a risk of significant impact. However, a staff assessment of the probability of occurrence of the release and/or the nature of the potential receptor may determine that the likelihood and extent of potential exposure are not sufficient to support a finding of potentially significant impact. (Ex. 56, p. 61.)

The applicant provided the results of modeling for a worst-case accidental release of aqueous ammonia. The worst-case release scenario is associated with a postulated spontaneous catastrophic storage tank failure. In conducting this analysis, it was assumed that spilled material would be contained in the covered basin below the storage vessel and that winds of 1.0 meters per second and category F stability would exist at the time of the accidental release. This screening analysis was designed to predict the maximum possible impacts based on distance from the storage tank without regard to specific direction of transport. This analysis indicated that concentrations exceeding 75 PPM would be confined to the project site. (Ex. 1, § 6.10.2.3.1, Ex. 9, p. 3; Ex. 56, p. 61.)

Staff agreed with Applicant's modeling approach and estimates of downwind concentrations associated with the storage tank failure scenario. However, staff believes that a more likely (if not worst-case) scenario would involve a release during transfer of ammonia from the delivery vehicle to the storage tank. Staff contends that provisions to catch a release between the delivery vehicle and the storage vessel are necessary to avoid such a release. Staff asserts that material spilled during delivery could result in a pool with significantly greater surface area than that reflected in the Applicant's modeling. We will require TMPP to prepare a plan addressing delivery of aqueous ammonia to significantly reduce the potential for human errors that could result in unanticipated releases. Staff asserts (and we concur) that the potential for an uncontained spill during delivery can be avoided by providing a catchment basin directing any spill that occurs during delivery to a covered basin. These additional

measures will reduce the potential effect of spills that are not reflected by the tank failure scenario. (Ex. 56, p. 61, see Conditions **HAZ-2** and **HAZ 4**.)

b. Natural Gas and Hydrogen

Natural gas, which will be used as a fuel by the project, poses a fire and/or explosion risk as a result of its flammability. While natural gas will be used in significant quantities, it will not be stored on-site. The risk of a fire and/or explosion from natural gas can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. (Ex. 1, § 6.10.2.2.1; Ex. 9, p. 2) The National Fire Protection Association (NFPA) Code 85A requires:

- the use of double block and bleed valves for gas shut-off;
- automated combustion controls; and
- burner management systems.

These measures will significantly reduce the likelihood of an explosion in gas fired equipment. Additionally, start-up procedures will require air purging of the gas turbines prior to start-up, thus precluding the presence of an explosive mixture. (Ex. 56, p. 61.)

The facility will also require the installation of a short natural gas pipeline that could result in accidental release of natural gas. The design of the natural gas pipeline is governed by laws and regulations discussed in the **Facility Design** section of the Decision. Staff believes that these measures are sufficient to reduce the risk of a natural gas release to insignificant levels. (Ex. 56, p. 62.)

Hydrogen will also be used by the project as a heat transfer fluid to cool the generators. The storage of hydrogen will be done in accordance with the requirements set forth in Title 8 of the California Code of Regulations. Hydrogen is both flammable and explosive. However it is unlikely that a fire or explosion involving this material would

result in significant impacts on the public as a result of the amounts stored and the distance separating the storage facility and public receptors. (Ex. 1, § 6.10.2.2.1; Ex. 56, p. 62.)

2. Mitigation

The worst-case accidental release scenario for ammonia evaluated by the applicant assumed that all accidental spills would occur from the storage vessel into the basin below the storage vessel. However, it is more likely that a spill would occur during delivery of ammonia. Such a spill could conceivably result in a large pool of aqueous ammonia and significantly higher down wind concentrations of ammonia. Thus, staff proposes a condition of certification requiring a catchment basin between the delivery vehicle and the storage loading connection. This basin would passively drain into the basin below the storage tank or into a separate covered basin capable of containing the entire delivery vehicle's volume and eliminating the down wind effect. (Ex. 56, p. 62.)

As discussed above, Staff also proposes, and we adopt, a condition requiring development of a safety management plan for delivery of aqueous ammonia. The development of a Safety Management Plan addressing delivery of ammonia will further reduce the risk of any accidental release. (Ex. 56, pp. 62-63.)

3. Closure

The requirements for handling of hazardous materials remain in effect until such materials are removed from the site. Regardless of facility closure the facility owners are responsible for continuing to handle such materials in a safe manner, as required by applicable laws. In the event that the facility owner abandons the facility in a manner which poses a risk to surrounding populations, staff will coordinate corrective action with the California Office of Emergency Services, Shasta County Environmental Health Department and the California Department of Toxic Substances Control (DTSC) to ensure that any unacceptable risk to the public is eliminated. Funding for such

emergency action can be provided by federal, state or local agencies until the cost can be recovered from the responsible parties. (Ex. 56, p. 62.)

FINDINGS AND CONCLUSIONS

Based on the uncontroverted evidence of record, the Commission makes the following Findings:

1. The Three Mountain Power Project will use hazardous materials during construction and operation, including aqueous ammonia, natural gas and hydrogen.
2. The major public health and safety hazards associated with these hazardous materials are the accidental release of aqueous ammonia and fire and explosion from natural gas and hydrogen.
3. The project owner will submit an approved Safety Management Plan for ammonia delivery, an approved Hazardous Materials Business Plan, and an approved Risk Management Plan prior to delivery of any hazardous materials to the site.
4. Implementation of the mitigation measures described in the evidentiary record and contained in the Conditions of Certification, below, ensures that the project will not cause significant impacts to public health and safety as the result of handling hazardous materials.

With implementation of the Conditions of Certification, below, the Three Mountain Power Project will comply with all applicable laws, ordinances, regulations, and standards identified in the pertinent portion of Appendix A of this Decision. The Commission concludes, therefore, that the use of hazardous materials by the Three Mountain Power Project will not result in any significant adverse public health and safety impacts.

CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous material in reportable quantities, as specified in Title 40, C. F.R. Part 355, Subpart J, section 355.50, not listed in Appendix B, below, or in greater quantities than those identified by chemical name in Appendix B, below, unless approved in advance by the CPM.

Verification: The project owner shall provide to the CPM, in the Annual Compliance Report, a list of hazardous materials contained at the facility in reportable quantities.

HAZ-2 The project owner shall develop and implement a safety management plan for delivery of ammonia. The plan shall include procedures, protective equipment requirements, training and a checklist.

Verification: At least 60 days prior to the delivery of aqueous ammonia to the facility, the project owner shall provide a safety management plan as described above to the CPM for review and approval.

HAZ-3 The aqueous ammonia storage facility shall be designed to either the ASME Pressure Vessel Code and ANSI K61.6 or to API 620. In either case, the storage tank shall be protected by a secondary containment basin capable of holding 150% of the storage volume plus the volume associated with 24 hours of rain assuming a 25 year storm.

Verification: At least 60 days prior to delivery of aqueous ammonia to the facility, the project owner shall submit final design drawings and specifications for the ammonia storage tank and secondary containment basin to the CPM for review and approval.

HAZ-4 The project owner shall provide a covered secondary containment basin to passively contain any spill during the delivery of aqueous ammonia to the storage facility.

Verification: At least 60 days prior to construction of the secondary containment basin described above, the project owner shall provide detailed design drawings and specifications for the secondary containment basin to the CPM for review and approval.

E. WASTE MANAGEMENT

The project will generate hazardous and nonhazardous wastes during construction and operation. This section reviews the Applicant's waste management plans for reducing the risks and environmental impacts associated with the handling, storage, and disposal of project-related wastes. Federal and state laws regulate the management of hazardous waste. Hazardous waste generators must obtain EPA identification numbers, and use only permitted treatment, storage, and disposal facilities. Registered hazardous waste transporters must handle the transfer of hazardous waste to disposal facilities.

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Site Excavation

The Applicant commissioned a Phase I Environmental Site Assessment (ESA) to determine the presence or likely presence of hazardous substances or petroleum products at the site and the surrounding area. The Phase I ESA reported no evidence of the use, storage, or disposal of hazardous substances or petroleum hydrocarbons on the site or linear facilities. Limited surface soil staining was observed in the west-central portion of the site and is believed to be associated with a spontaneous combustion fire of a pile of wood chips. (Ex. 1, § 6.12.1; Ex. 56, p. 73.) If contaminated soils are encountered during site preparation or linear facility construction, the soil will be segregated, sampled and tested to determine the extent of contamination. If the soil is classified as hazardous, the Shasta County Environmental Health Department will be notified and the soil taken to an appropriate landfill, treatment or recycling facility. (Ex. 1, § 6.12.2.1.1; Ex. 56, p. 73.)

Applicant also reviewed federal, state and regional database lists of reported hazardous waste and substance sites, and determined that there are no nearby properties that have the potential to affect the proposed plant site. (Ex. 56, p.73.)

2. Construction

a. Nonhazardous

Nonhazardous waste streams from construction may include paper, cardboard, wood, glass, and plastics. These will be generated from packing materials, waste construction lumber, insulation materials, and empty containers. (Ex. 1, § 6.12.2.1.1; Ex. 56, p. 73.) Applicant estimated that about 50 cubic yards of these wastes will be generated on a weekly basis. Wastes which cannot be recycled will be collected in a covered dumpster maintained on site and disposed of in a Class III (nonhazardous) landfill. (Ex. 56. p. 73.)

b. Hazardous Wastes

Hazardous wastes that may be generated during construction include waste oil and grease, paint, used batteries, spent solvent, welding materials, and cleanup materials from spills of hazardous substances. The construction contractor is considered the actual waste generator and will be responsible for proper hazardous waste handling. Hazardous waste will be either recycled or disposed of in a licensed Class I hazardous waste landfill or treatment facility. (Ex. 56, p. 74.)

Initial pre-operational cleaning of internal surfaces of the heat recovery steam generators and turbines will also generate chemical waste, cleaning solutions and filters. The cleaning will be conducted by a licensed contractor who will transport the waste offsite for proper treatment and disposal in accordance with applicable regulatory requirements. (Ex. 56, p. 74.)

3. Operation

a. Nonhazardous

Nonhazardous wastes generated during plant operation include trash, office wastes, empty containers, broken or used parts, used packing material, softener and crystallizer waste, and used filters. The quantities of nonhazardous wastes generated from gas-fired facilities such as TMPP are typically minor. The applicant estimates that about five cubic yards of such wastes will be generated monthly. (Ex. 56, p. 74.)

b. Hazardous Waste

Routine project operation will generate a variety of hazardous wastes, including cleaning solutions, spent air pollution control catalysts, used oil and filters, used cleaning solvents, used batteries, and spent water treatment resins. Much of the hazardous wastes generated will be recycled. (Ex. 56, p. 74.)

4. Potential Impacts on Waste Disposal Facilities

a. Nonhazardous Waste

Nonhazardous waste that is not recycled will be disposed of at one of the regional Class III landfills in the area. TMPP nonhazardous wastes are a small fraction (less than one tenth of one percent) of the daily permitted capacity of either of the two nonhazardous landfills in Shasta County. Although the Anderson landfill has only about five years of remaining capacity, the West Central landfill has a permitted and approved addition which will extend its capacity for up to 25 years, and additional planned and approved phases which would allow up to 100 years of operation. (Ex. 56, p. 74.)

b. Hazardous Waste

Three Class I landfills in California, at Kettleman Hills in King's County, Buttonwillow in Kern County, and Westmoreland in Imperial County, are permitted to accept hazardous waste. In total, there is in excess of twenty million cubic yards of remaining hazardous waste disposal capacity at these landfills, with remaining operating lifetimes as long as 90 years. The amount of hazardous waste transported to these landfills has decreased in recent years due to source reduction efforts by generators, and the transport of waste out of state that is hazardous under California law, but not federal law. (Ex. 1, § 6.12.2.3.2; Ex. 56, p. 75.)

Much of the hazardous waste generated during facility construction and operation will be recycled, such as used oil and spent catalysts. Even without recycling, the generation of hazardous waste from TMPP will be minor and not significantly impact the capacity of any of the State's Class I landfills. (Ex. 1, § 6.12.2.3.2; Ex. 56, p. 75.)

5. Zero Liquid Discharge System

TMPP was originally configured to employ an evaporative (wet) cooling tower system. The applicant subsequently filed a Detailed Mitigation Plan that proposed to utilize instead a parallel hybrid wet/dry cooling system with a zero liquid discharge (ZLD) system that eliminates the need for wastewater percolation or evaporation ponds. This system consists of a side stream softener, reverse osmosis (RO) system, brine concentrator (or evaporator), and crystallizer. (Ex. 66, Project Description Testimony, pp. 3-4.)

The side stream softener provides high quality water that allows the cycles of concentration for the cooling tower water to be increased to about twenty. The RO system is used to treat cooling tower blowdown. Product water from the RO system is reused in the cooling tower and reject is sent to the brine concentrator/crystallizer

system. The brine concentrator produces a highly concentrated waste blowdown (brine product) which is fed to the crystallizer feed tank. In the crystallizer, the brine becomes supersaturated in salts, which then precipitate from solution as crystals. These crystals are continuously removed by filtration and discharged from the system. As a result, no process wastewater will exit the facility. The solids that accumulate in the softener and crystallizer will have to be disposed of by transfer to a landfill. (Ex. 64, p. 125; Ex. 66, Project Description Testimony, pp. 3-4.)

TMPP estimates that annual waste generation from the softener filter press will be about 883 tons and about 653 tons will be generated annually from the crystallizer filter press. In a laboratory simulation of the zero liquid discharge system, an analysis of the solid wastes similar to those that would be generated from the softener as well as the crystallizer indicated that all metals of concern were below California regulatory limits that define hazardous waste. Because the Burney Water District will provide reclaimed wastewater to the project to be used as process water, additional laboratory analysis was performed on wastewater discharged to the District's percolation ponds. No significant presence of metals or hazardous substances was detected. Therefore, use of reclaimed wastewater will not alter the classification of the waste. (Ex. 64, p. 125; Ex. 66, Waste Management Testimony of Valorie L. Thompson, pp. 2-3.)

Although the solid wastes generated from the softener and crystallizer will not be classified as hazardous, they will still be considered a California-designated waste due to their high salt content. This category of designated waste includes nonhazardous waste that contains pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations that could exceed applicable water quality objectives or affect the beneficial uses of waters of the state. Designated wastes are required to be disposed of at Class I or Class II disposal sites. TMPP has identified two suitable disposal sites in the project vicinity, and has proposed to use the Lockwood Regional Landfill in Lockwood, Nevada, which currently accepts filter cake from other facilities. Lockwood currently accepts about 5800 tons per day and has a

remaining life of about 27 years at its current permitted area of 555 acres. Additionally, it has about 1550 acres available for future expansion. Wastes from TMPP would account for about 0.1 percent of the annual wastes accepted at Lockwood and would have no significant impact on either the daily operating capacity or remaining life of the facility. (Ex. 64, pp. 125-126; Ex. 66, Waste Management Testimony of David P. Hochmuth, pp. 6-7.)

6. Mitigation

The Applicant intends to implement the following mitigation measures during construction and operation of the project:

- Prior to facility startup, a waste management plan will be developed which will include details on the handling, packaging, labeling, storage, record keeping, treatment and disposal of wastes. It will also include provisions for personnel training and emergency procedures.
- A waste minimization program will be designed that includes procedures to reduce inventories of hazardous materials, thus avoiding the need to dispose of excess hazardous materials as wastes. Hazardous wastes will be recycled wherever possible, and nonhazardous and non-waste-generating materials will be used in place of hazardous materials.

Staff has concluded that these mitigation measures, enforced by Commission imposed conditions, together with applicable LORS, will adequately assure that no significant environmental impacts will result from the management and disposal of project-related waste. (Ex. 56, p. 76.)

7. Closure

During any type of facility closure, the primary waste management related concern is that project wastes not pose any potentially significant problem to the public, workers, or the environment. The conditions of certification in the **General Conditions** section of this decision will adequately address waste management issues related to closure. (Ex. 56, pp. 75-76.)

FINDINGS AND CONCLUSIONS

Based on the uncontroverted evidence of record, the Commission makes the following findings and conclusions:

1. The project will generate hazardous and nonhazardous wastes during construction and operation.
2. Under TMPP's waste management plan, the project will recycle hazardous and nonhazardous wastes to the extent possible and in compliance with applicable law.
3. Hazardous wastes that cannot be recycled, will be transported by registered hazardous waste transporters to an appropriate Class I landfill.
4. Nonhazardous wastes that cannot be recycled will be deposited at a Class III landfills.
5. Construction and operation of the zero liquid discharge system would not have any significant effects on any of the other waste streams generated at Three Mountain.
6. Disposal of project wastes will not result in any significant direct or cumulative impacts to existing waste disposal facilities.

The Conditions of Certification, below, and the waste management practices described in the evidentiary record reduce potential impacts to insignificant levels and ensure that project wastes are handled in an environmentally safe manner. The Commission therefore concludes that the management of project wastes will comply with all applicable laws, ordinances, regulations, and standards related to waste management as identified in the pertinent portion of Appendix A of this Decision.

CONDITIONS OF CERTIFICATION

WASTE-1 The project owner shall obtain a hazardous waste generator identification number from the Department of Toxic Substances Control prior to generating any hazardous waste.

Verification: The project owner shall keep its copy of the identification number on file at the project site and notify the CPM via the monthly compliance report of its receipt.

WASTE-2 Upon becoming aware of any impending waste management-related enforcement action, the project owner shall notify the CPM of the enforcement action taken or proposed to be taken against it, or against any waste hauler or disposal facility or treatment operator that the owner contracts with.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending waste management-related enforcement action.

WASTE-3 Prior to the start of both construction and operation, the project owner shall prepare and submit to the CPM, for review and comment, a waste management plan for all wastes generated during construction and operation of the facility, respectively. The plans shall contain, at a minimum, the following:

- A description of all expected waste streams, including projections of frequency and hazard classifications; and
- Methods of managing each waste, including treatment methods and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

Verification: No less than 60 days prior to the start of construction, the project owner shall submit the construction waste management plan to the CPM for review. The operation waste management plan shall be submitted no less than 60 days prior to the start of project operation. The project owner shall submit any required revisions within 30 days of notification by the CPM (or mutually agreed upon date). In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to planned management methods.

WASTE-4 The project owner shall have an environmental professional (as defined by American Society for Testing and Materials practice E 1527-97 Standard Practice for Phase I environmental Site Assessments) available for consultation during soil excavation activities. If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, or other signs, prior to any further construction activity at that location, the environmental professional shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner stating the recommended course of action. If, in the opinion of the environmental professional, significant remediation may be required, the project owner shall contact representatives of the Shasta County Environmental Health Department and the Sacramento Field Office of the California Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall notify the CPM in writing within 5 days of any reports filed by the environmental professional, and indicate if any substantive issues have been raised.

WASTE-5 In areas of visible soil staining resulting from wood chip storage pile fires, the project owner shall conduct representative surface soil sampling for polynuclear aromatic hydrocarbons (PAHs), dioxins, and furans. If, in the opinion of the environmental professional, significant remediation may be required, the project owner shall contact representatives of the Shasta County Environmental Health Department and the Sacramento Field Office of the California Department of Toxic Substances Control for guidance and possible oversight.

Verification: Thirty days prior to disturbing earth which may be contaminated with byproducts from wood chip combustion, the project owner shall submit to the CPM results from the soil sampling required in WASTE-5, the recommendation of the environmental professional regarding the need for remediation, and notification of any contact made with the Shasta County Environmental Health Department and the Sacramento Field Office of the California Department of Toxic Substances Control.

WASTE-6 Except for the routine collection and storage of wastes, the project owner shall not store or accumulate on site wrecked or dismantled vehicles or parts, discarded items, junk, or inoperable machinery.

Protocol: The project owner shall certify in the annual compliance report that storage of prohibited materials has not occurred.

WASTE-7 The project owner shall dispose of filter cakes from the zero liquid discharge system softener and crystallizer at the Lockwood Regional Landfill in Lockwood, Nevada, or a CPM approved alternative site.

Verification: The project owner shall maintain records of waste shipments to the Lockwood Regional Landfill and retain receipts or manifests from the landfill on site. The receipts shall be made available to the CEC CPM upon request.

VII. ENVIRONMENTAL ASSESSMENT

Under its statutory mandate, the Commission must evaluate a project's potential effect upon the environment. The Commission reviews the specific topics of biological resources, soil and water resources, cultural resources, and geological/paleontological resources to determine whether project-related activities will result in adverse impacts to the natural and human environment.

A. BIOLOGICAL RESOURCES

The Commission must consider the potential impacts of project-related activities on biological resources, including state and federally listed species, species of special concern, wetlands, and other topics of critical biological interest such as unique habitats. The following review describes the biological resources of the project site and ancillary facilities, assesses the potential for impacts on biological resources, and determines the adequacy of proposed mitigation measures to ensure compliance with all applicable laws, ordinances, regulations, and standards.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The project is located in the southeast corner of the Cascade Range that is in a transitional zone between the Cascades, Sierra Nevada, Basin and Range, and Modoc Plateau geomorphic provinces. Biotic communities in Burney Valley include ponderosa pine forest, volcanic talus, freshwater marsh, montane chaparral, and annual grasslands. The area is surrounded by volcanic cinder cones and mountains. Lake Britton, Burney Falls, and the Pit River are located approximately 5 miles to the north. Hat Creek, including Crystal Lake, is about 4.5 miles east. Sensitive natural communities in the area include the Pit River drainage and northern basalt flow vernal pool. The Burney watershed consists predominately of volcanic rocks from relatively young, highly fractured volcanic

flows. This volcanic parent material creates highly permeable soils. The Burney aquifer is also composed of these fractured lava flows and groundwater emerges as clear, cold water springs. This unique ecosystem is one of the largest spring systems in the United States. The springs provide unique habitat for many sensitive and listed species. The groundwater is recharged solely through precipitation, which rapidly percolates to the aquifer system with little or no filtration. The aquifer system is regionally unconfined and the quantity of groundwater stored in the fractures is limited. Staff found the aquifer to be susceptible to rapid declines in groundwater levels during drought conditions and is vulnerable to contamination from unfiltered sources. (Ex. 65, p. 33.)

The Applicant provided lists of sensitive plant and animal species potentially occurring within the site and vicinity, as did Staff. In addition, Staff received a list of endemic, sensitive species that could occur in the project area from Dr. Ellis, the expert for the Intervenor, Burney Resource Group (BRG).³⁹ Dr. Ellis' list is reproduced below as **Biological Resources Table 1**. The area is also renowned for its trout fishing, and supports both stocked and the Pit River strain of rainbow trout, one of the few remaining wild or pure strains of trout in the state. (Ex. 65, p. 35.)

³⁹ Table 1, 2 and 3 of Exhibit 65, at pages 34, 37-38, and Tables 6.13-1, 6.13-2 and 6.13-3 of Exhibit 1 contain complete listings of the sensitive species considered for this project.

BIOLOGICAL RESOURCES Table 1
Watershed Special Status Species Known or Potentially Occurring in the Burney Area

Common Name	Scientific Name	Status ¹	Potential/Area
Fish			
Rough sculpin	<i>Cottus asperimus</i>	-/T	Clear springs
Bigeye marbled sculpin	<i>Cottus klamathensis macrops</i>	CSC	Clear springs
Invertebrates			
Shasta crayfish	<i>Pacifastacus fortis</i>	E/E	Clear springs
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	T/-	Vernal pools
California linderiella	<i>Linderiella occidentalis</i>	SC/-	Vernal pools
Vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	E/-	Vernal pools
Terrestrial Mollusks			
Oregon shoulderband snail	<i>Helminthoglypta herleini</i>	ROD S&M	Springs less than 1 cfs
Klamath shoulderband snail	<i>Helminthoglypta talmadgei</i>	ROD S&M	Springs less than 1 cfs
Siskiyou sideband snail	<i>Monadenia chaceana</i>	ROD S&M	Springs less than 1 cfs
Church's sideband snail	<i>Monadenia churchi</i>	ROD S&M	Springs less than 1 cfs
Shasta sideband snail	<i>Monadenia troglodytes troglodytes</i>	FSC, ROD S&M	Springs less than 1 cfs
Wintu sideband snail	<i>Mondenia troglodytes wintu</i>	FSC, ROD S&M	Springs less than 1 cfs
Shasta chaparral snail	<i>Trilobopsis roperi</i>	ROD S&M	Springs less than 1 cfs
Tehama chaparral snail	<i>Trilobopsis tehamana</i>	ROD S&M	Springs less than 1 cfs
Pressley Hesperian snail	<i>Vespericola pressleyi</i>	ROD S&M	Springs less than 1 cfs
Shasta Hesperian snail	<i>Vespericola shasta</i>	ROD S&M	Springs less than 1 cfs
Papilose tail-dropper slug	<i>Prophysan dubium</i>	ROD S&M	Springs less than 1 cfs
Aquatic Mollusks			
Potem pebblesnail	<i>Fluminicola n. sp.</i>	ROD S&M	Springs & River
Flat-top pebblesnail	<i>Fluminicola n. sp.</i>	ROD S&M	Springs & River
Shasta springs pebblesnail	<i>Fluminicola n. sp.</i>	ROD S&M	Springs & River
Disjunct pebblesnail	<i>Fluminicola n. sp.</i>	ROD S&M	Springs & River
Globular Pebblesnail	<i>Fluminicola n. sp.</i>	ROD S&M	Springs & River
Umbilicate pebblesnail	<i>Fluminicola n. sp.</i>	ROD S&M	Springs & River
Lost Creek pebblesnail	<i>Fluminicola n. sp.</i>	ROD S&M	Springs & River
Nugget pebblesnail	<i>Fluminicola seminalis</i>	ROD S&M	Springs & River
Scalloped juga snail	<i>Juga occata</i>	FSS	Springs & River
Topaz Juga	<i>Juga acutifilosa</i>	FSS	Springs & River
Cinnamon juga snail	<i>Juga n. sp.</i>	ROD S&M	Springs & River
Canary duskysnail	<i>Lyogyrus n. sp.</i>	ROD S&M	Springs & River
Knobby rams-horn snail	<i>Vorticifex n. sp.</i>	ROD S&M	Springs & River
Great Basin rams-horn	<i>Helisoma newberryi newberryi</i>	FSS	Springs & River
California floater mussel	<i>Anodonta californiensis</i>	FSC, FSS	Lake Britton & River proper
Montane peaclam	<i>Pisidium ultramontanum</i>	FSC, FSS	River proper & margins
Amphibians			
Shasta salamander	<i>Hydromantes shastae</i>	CT	limestone
Foothill yellow-legged frog	<i>Rana boylei</i>	FSC, FSS, CSC	River
Cascade frog	<i>Rana cascade</i>	FSC, FSS, CSC	River proper & margins
Northern leopard frog	<i>Rana pipiens</i>	FSS, CSC	River proper & margins
Spotted frog	<i>Rana pretiosa</i>	FSS, CSC	River proper & margins
Reptiles			
Northwestern pond turtle	<i>Clemmys marmorata marmorata</i>	FSS, CSC	Ponds & streams

¹ ROD S&M: U.S. Forest Service Record of Decision C-3 Survey and Manage Species

FSC: Federal Species of Concern

FSS: U.S. Forest Service Sensitive

The power plant, switchyard, and gas and water pipeline routes are located within ponderosa pine forest habitat. The power plant will occupy 10.2 acres of an existing disturbed 40-acre site, zoned for general industrial use. The power plant site proper is disturbed by current activities associated with the 10 MW Burney Mountain Power (BMP) biomass power plant that occupies a portion of the site. Wildlife use around the site would be minimal and include black-tailed mule deer, common raven, coyote, hares, and various raptors including red-tailed hawk, northern harrier, cooper's hawk, and American kestrel. The laydown area and switchyard will be located on compacted soil within the 40-acre site. The access road is existing. The natural gas pipeline route (Alternative A) follows the access road from the plant site to Highway 299 for about 670 feet and travels east through ponderosa pine habitat for the remaining 2,230 feet. A 3-acre laydown area on each end of the pipeline will be located in disturbed areas. (*Ibid.*)

The project will use a parallel hybrid wet and dry cooling system that will use both reclaimed and ground water. Reclaimed water for the cooling system and potable water will be supplied by Burney Water District (BWD) by a 500-foot line from the treatment plant located just southwest of the power plant site. Ground water will be supplied from two new wells and about 4,700 feet of a new water line through ponderosa pine habitat. (*Ibid.*)

A new transmission line will be built from the power plant to an existing PG&E 230 kV line to the north. The new line begins at a 2-acre switchyard site located at the northeast corner of the property. The switchyard site is disturbed. The line runs through ponderosa pine habitat along the northern boundary of the property for 800 feet, then turns north and follows an existing railroad right-of-way and a 60 kV distribution line adjacent to ponderosa pine habitat for 1,800 feet. (Ex. 65, p. 36.)

Approximately 60 miles of an existing 230 kV line will be reconducted. From the power plant site the line travels west about 5 miles then splits, running north for 9 miles to the Pit 3 Substation and west 14 miles to the Round Mountain Substation. From Round Mountain, the line runs south for 32 miles to the Cottonwood Substation. The 230 kV transmission line transverses several habitat types. The right of way is periodically cleared by PG&E and consists mostly of chaparral, small trees, and grassland. Primary habitats from the plant site to the Round Mountain substation are mixed coniferous forest, montane chaparral, wet montane meadows, and burned ponderosa pine forest. Primary habitats from the Round Mountain substation to the Cottonwood substation include burned and unburned ponderosa pine forest, chaparral, grassland, blue oak–foothill pine woodland, mixed evergreen forest, wet meadow, northern volcanic vernal pools, and valley oak riparian. Primary habitats along the spur to Pit 3 substation include ponderosa pine forest, wet meadow, chaparral, and mixed coniferous forest. The transmission line route crosses 2 rivers and 14 creeks. Shasta National Forest lands are crossed by approximately 1.5 miles of the transmission line. Portions of the line cross critical deer wintering range. Several raptor species are likely to inhabit the surrounding areas. Osprey, golden eagle, bald eagle, red-tailed hawk, great-horned owl, and common raven nests can occur on the towers. A complete list of sensitive species known to occur in the vicinity of the transmission line corridor was provided by the applicant. Species observed and/or with the highest potential to occur along the corridor are described in Staff's **Biological Resources Tables 2 and 3**, as shown in Exhibit 65, at pages 37-38.

Potential Impacts

Wildlife Habitat and Sensitive Plant Community. The proposed project will result in the direct permanent loss of 18.78 acres of ponderosa pine habitat from the footprints of the project components and direct temporary loss 0.77 acres of grassland habitat from construction activities. (See **Biological Resources Table**

4, below, replicated from Ex. 65, p. 39 for a breakdown of these losses.) The applicant proposes to re-vegetate areas disturbed with a grassland mixture and to remove any re-growth of brush and trees. Therefore, impacts to ponderosa pine habitat are considered permanent and impacts to grassland habitat are considered temporary. The power plant site proper will be located on an industrial site. Wildlife use of the immediate vicinity surrounding the proposed power plant site is minimal. The loss of approximately 19 acres of ponderosa pine and grassland habitat will not cause a significant impact. (Ex. 65, p. 39.)

BIOLOGICAL RESOURCES Table 4
Permanent and Temporary Habitat Disturbance (acres) from the Project

Facility	Area Required	Existing Disturbed	Permanent Ponderosa Pine	Temporary Grassland
Power Plant/laydown	10.2	9.2	1	
Water Supply	14.09	0	2.7	0.64
New T-Line	17.9	6	11.9	
Switchyard	2	2		
Linear laydown	18	18		
Gas Supply	3.91	0.6	3.18	0.13
Totals:	66.1	35.80	18.78	0.77

Source: Ex. 65, 39.

Power Plant Water Use. TMPP will build the new facility and retrofit the existing BMP plant with a wet/dry cooling system. Water for the cooling towers will be supplied by two new wells located south of the site and by reclaimed water from BWD. BWD will supply approximately 300 acre feet per year (AFY) of reclaimed water, with an upper limit of up to 500 AFY. A total of 950 AFY of groundwater will be supplied by new and existing wells. Of this amount, 350 AFY is currently used by BMP but some (~125 AFY) of this amount will be made available to TMPP once BMP has been retrofitted to a wet/dry cooling system. If BMP is not operating, all 350 AFY can be used by TMPP. Because the 300 AFY of reclaimed water would have been supplied to the groundwater via the percolation ponds at the wastewater treatment facility, a total of 1,250 AFY will be removed

from the aquifer. This represents 900 AFY of new groundwater use. (Ex. 65, pp 39-40.)

The sensitive resources listed in **Biological Resources Table 1**, above, are dependent on the springs, streams or rivers in the area. Most of these are endemic to the local area and their small and isolated habitats put them at a higher risk of extinction and make them vulnerable to adverse impacts. Four are federally and/or state endangered or threatened, seven are federal species of concern, six are state species of special concern, nine are U.S. Forest Service sensitive species, and twenty-two are U.S. Forest Service Record of Decision C-3 Survey and Manage Species (ROM S&M). The Northwest Forest Plan (1999) includes measures to protect these species and the Standards and Guidelines (Attachment A of the Northwest Forest Plan) require identification, mapping, and management of known sites. The Northwest Forest Plan applies to Forest Service and Bureau of Land Management Lands. The aquifer that will supply the power plant also supplies the regional area that includes US Forest Service lands down-gradient of the well sites. (Ex. 65, p. 40.)

The federally and state endangered Shasta crayfish, the only surviving native crayfish in California, has a distribution that is limited to the midsections of the Pit River drainage, primarily the Fall River and Hat Creek subdrainages. Habitat requirements of the Shasta crayfish are cool, clear, spring-fed headwaters that include volcanic cobbles and boulders. The primary threat to the Shasta crayfish is the invasion of the exotic signal crayfish. However, hydroelectric development, past fisheries management, and other developments that have altered the ecosystem and/or resulted in changes to the system's temperature, clarity, or discharge of the springs or water in Shasta crayfish habitat can also be responsible for population declines. (*Ibid.*; See also Ex. 82.)

In May and June 2000, Garcia and Associates (Ganda), on behalf of Applicant, conducted a cursory level survey of springs and reaches that could be impacted

by the project. However, the presence of terrestrial mollusks could not be confirmed as survey protocols (surveys conducted after the first rain) were not followed and surveys were not conducted in some areas due to time constraints. Surveys for Shasta crayfish were only based on habitat conditions, as permits to survey for this species were not acquired. According to Staff, springs and reaches located north and northeast of the project site that could be impacted by groundwater pumping include: Burney Creek, Burney Falls, Rim of the Lake, Salmon Springs, Old Mine Pond, Sand Pit Road, Hat Creek Park South, Rocky Ledge, and Canal. Results of these surveys found the occurrence of four aquatic mollusks that are potentially special status species. Confirmed or potential for occurrence of sensitive aquatic species including rough and bigeye marble sculpins and aquatic and terrestrial mollusks were also documented. Shasta crayfish were not observed in the springs directly north and northeast of the project. Because of suitable habitat and the proximity to adjacent historical habitat, *potential* for occurrence was documented at Salmon Springs, Rim of the Lake Springs, Burney Creek, and Rocky Ledge Spring. Crystal Lake springs, located in the Hat Creek subdrainage, supports one of the seven remaining population centers of Shasta Crayfish (Ex. 65, p. 41 as amended by 12/19 RT 180; Ex. 82; Ex. 84, Biological Resources Testimony, p. 8.)

Applicant's assessment of impacts to the springs concluded that withdrawal of water for TMPP use would result in only minor changes to the springs. During years of normal precipitation, TMPP pumping would cause a 0.68% decrease in spring flow, a 0.03 to 0.26% decrease in wetted area, and reductions in average velocity of 0 to 0.0095 feet per second (fps). Applicant's studies also concluded that the withdrawal of water for TMPP use would have a negligible effect on spring flows even during drought years. During drought, reduction in flows would be 0.61 to 1.52%, reduction in wetted areas would be 0.04 to 0.34%, and reduction in velocities would be 0 to 0.0123 fps. Using flows at Burney Falls during the driest year of a 5-year drought and factoring an additional consumptive use in the year 2030 of 1,300 AFY, TMPP determined that percent

reduction in Burney Falls would be 34% without TMPP water use and 35% with TMPP water use. The difference of 0.68% was then assumed to be the added impact from TMPP water use. This value was then used as the change in discharge for all other springs. (Ex. 65, pp. 41-42.)

Staff disagreed with Applicant's analysis because the calculations were based on assumptions Staff believed to be unsupported by sufficient evidence. Staff testified that small springs and springs located at elevations near the elevation of the ground water table react differently than large springs such as Burney Falls and experience a more rapid reduction in flows during drought conditions. Also, during the above mentioned 5-year drought (which is not the worst drought on record), flows to two large springs that were monitored in the Hat Creek area (Crystal Lake and Fall River) were reduced by 50%, Salmon Springs was reduced by 60%, and numerous smaller springs (less than 1 cubic-foot per second) dried up. These reductions greatly exceed the 35% reduction estimated by TMPP. Further, while Applicant calculated percent reduction in flows based on 900 AFY averaged over a 12-month period, the majority of TMPP's water use (537 AFY) will occur during the warmer months (June-August) when no groundwater recharge is occurring and pumping would have the greatest impact on the hydrology. (Ex. 65, p. 42.)

As discussed in the **Soil and Water Resources** section of this Decision, staff concluded that the complexity of the aquifer and lack of information on preferential flow paths within the aquifer prevents a clear determination of changes in spring hydrology from TMPP's water use. However, using all of the available data, Staff has estimated that reductions in water supply, and therefore spring flow, from TMPP water use alone would be about 1% during normal conditions and 2% during drought. Due to its uncertainty about whether Hat Creek and Burney Basin are hydrologically distinct, Staff assumed reductions in flows to Crystal Lake springs would be similar. Staff testified that these negligible reductions in flow would not result in adverse habitat changes to the springs.

Therefore, Staff concluded, as did Applicant, that TMPP water use *alone*⁴⁰ will not result in significant direct impacts to the aquatic-associated species and potential Shasta crayfish habitat or to known Shasta crayfish habitat. (*Ibid.*) We agree.

Wildlife. Indirect effects of the project include displacement of wildlife from construction activities, increased potential for vehicle-related injuries to wildlife, and disturbance to wildlife from noise and lighting during operation. Displacement of wildlife, such as deer and lagomorphs, will be temporary during the construction period. Vehicular accidents can be reduced by enforced speed limits. Noise and lighting disturbance should not greatly exceed current levels at the site. Therefore, none of these impacts are expected to be significant. (Ex. 64, p. 42.)

Transmission Line Reconductoring. Reconductoring of the PG&E 230 kV line will require the removal of existing and installation of new conductors and insulators. Ground crews and helicopters will visit each tower. Old and new insulators will be transported by helicopter. Old conductors will be pulled using the tension stringing method and will not be dragged along the ground or cause crushing or clearing of vegetation. New conductors will be pulled through the new insulators simultaneously. Pull and tension sites will be established every 2-4 miles. Equipment will include one truck-mounted Utah sprocket conductor puller, one or two trailer-mounted take-up spools to reel in old conductors, and various light trucks for workers and materials. Construction will occur from mid-August to December. Each section will require three or four days of work and the helicopter will hover no more than ten minutes above each tower. (Ex. 65, p. 43.)

Twenty pull sites requiring 3 acres each (60 acres total) have been identified. Pull sites will be graded to provide cleared, flat terrain for pulling and tension

⁴⁰ But see the cumulative impact analysis and discussion, below.

vehicles. Habitat types that will be impacted by the pull sites are provided in **Biological Resources Table 5**, below. Crews will use existing access roads that are in good condition and no grading or other improvements are anticipated. Transmission towers will not be replaced but some may have to be raised to increase ground clearance. Raising towers will require a rubber-tired lifting crane to physically lift the entire tower so bolts and vertical extensions can be installed.

BIOLOGICAL RESOURCES Table 5
Habitats Impacted by the Pull Sites for Transmission Line
Reconductoring

Habitat	Acres	Pull Site Numbers
Developed	6	1, 20
Blue Oak Woodland	6	2, 6
Annual Grassland	3	3
Annual Grassland, Blue Oak Woodland	6	4,5
Annual Grassland, Wet Meadow	3	17
Mixed Forest	12	7,8,9,10
Burned chaparral, Coniferous Forest	3	11
Coniferous Forest (3 sites burned)	15	12,13,14,18,19
Burned Coniferous Forest, Montane Chaparral	3	15
Ponderosa Pine Forest	3	16
Totals:	60	20

Source: Ex. 65, p. 43.

Reconnaissance level surveys conducted in April 1999 were too early to identify all occurrences of sensitive plant species, but they did identify potential areas for occurrence. (See **Biological Resources Table 6**, below.) Fourteen sensitive plant species were either present or have moderate to high potential to occur along the route. Two of these, Boggs Lake hedge-hyssop and slender orcutt grass are listed species that inhabit seasonal wetlands or vernal pool areas. Six sites have wetland, vernal pool, and/or marsh habitats. Follow-up surveys were conducted in May and June 2000 by Ganda. No listed species were found, but new populations of Ahart's paronychia and Woolly meadowfoam were recorded. The applicant has stated that pull sites will be located to avoid sensitive areas and will be re-vegetated to prevent erosion. (Ex. 65. Pp. 43-44; Ex. 84, Biological Resources Testimony, p. 6, modified by Errata, 12/19 RT 173-174.)

BIOLOGICAL RESOURCES Table 6
Results of Reconnaissance Surveys at or near Pull Sites

Pull Site	Location¹	Species Present (P) or Potentially Present (x)
1	T29N R4W S1	Wetlands (P), Red Bluff dwarf rush (x),
2	T30N R3W S16	Vernal pools (P), osprey nest (P), bald eagle (P), golden eagle, Cooper's hawk (P), Red Bluff dwarf rush (P), Ahart's paronychia (x), silky cryptantha (x)
3	T31N R3W S34	Vernal pools (P), osprey (P), woolly meadowfoam (P), Red Bluff dwarf rush (x), Ahart's paronychia (x), silky cryptantha (x)
4	T31N R3W S13	Wetlands (P), woolly meadowfoam (P)
5	T32N R2W S32	Red Bluff dwarf rush (x), Ahart's paronychia (x), silky cryptantha (x)
6	T32N R2W S22	Wetlands (P), vernal pools (P)
7	T33N R2W S36	Marsh (P), Butte fritillary (x)
8	T33N R1W S17	Butte fritillary (x)
9	T34N R1W S33	None found
10	T34N R1W S23	Butte County morning glory (x), Stillman's needlegrass (x), Shasta jewel-flower (x), Macnab cypress forest (x).
11	T34N R1E S9	None found – burned
12	T34N R1E S1	None found – burned
13	T34N R2E S5	None found – burned
14	T35N R2E S28	None found – burned
15	T35N R2E S13	Wetlands (P), long-haired star tulip (x)
16	T35N R3E S4	Osprey nest (P)
17	T35N R2E S23	Meadow (P), wetlands (x), long-haired star tulip (x)
18	T35N R2E S3	None found – burned
19	T36N R2E S9	Bald eagle territory (P), spotted owl territory (P), goshawk (x), pine martin (x), fisher (x)
20	T36N R2E S9	Developed

¹Latitude/Longitude provided in TMP 1999b, Table 3-1.

Source: Ex. 65, p. 45.

Thirty-eight sensitive wildlife species have a high or moderate potential to occur along the route. Of these, six inhabit waterways (e.g. Shasta crayfish) and four are bats. Waterways and bat roost sites (e.g. caves, mines, bridges) will not be impacted by construction activities. Construction will occur during deer migration and hunting seasons. The presence of equipment, helicopters, and work crews will create disturbances that will deter wildlife from using the area under construction. Deer and other wildlife using the area will likely be temporarily displaced from the segment under construction for 3 to 4 days. Deer are crepuscular (appearing during twilight hours) and generally bedded-down during daylight. Displacement of wildlife will be a temporary impact that is not considered significant. (Ex. 65, p. 44.)

Several raptors as well as ravens and magpies will use transmission line towers as nest sites. Others, such as the northern spotted owl (federally threatened) and other owl species, nest in tree cavities that may be difficult to detect but susceptible to disturbance from construction activities. Nesting territories and sometimes individual nest sites are often well established and reused for consecutive years. Bald eagle (federally threatened and state endangered), golden eagle, Cooper's hawk, red-tailed hawk, and osprey individuals and/or tower nest sites were observed. Northern spotted owl, goshawk, bank swallows, olive-side flycatcher, purple martin, and hermit warbler are known to be present in the area. Other raptors such as northern pygmy owl, northern saw-whet owl, flammulated owl, western screech owl, great-horned owl, sharp-shinned hawks, red-shouldered hawks, American kestrel, white-tailed kite, and northern harriers are undoubtedly present along the route. The nesting period for raptors varies by species, but generally extends from January to mid-August for all species. Disturbances at or near nest sites during the nesting season can lead to nest abandonment. Additionally, some existing tower nests will be removed or altered to accommodate reconductoring. TMPP has developed a Raptor Management Plan and will not conduct any transmission line activities during the nesting season, January to August. (Ex. 65, p. 44.)

In general, bird mortality from collisions with transmission lines is well documented and can be high for predatory raptors and migratory waterfowl. Avian collisions with the existing lines have not been documented and a cursory survey by Ganda under the line in spring 2000 did not find any dead birds. Given the distance of the line, potential waterfowl use in the southern area, and historic nesting territories of listed species, collision risk could be moderate. The line will not include a ground wire, which due to its position on lines and small gauge is generally most responsible for avian collisions. Therefore, collision risk is not expected to result in significant impacts. Nonetheless, collision risks to listed species include the bald eagle and northern spotted owl. The U. S. Fish and Wildlife Service has issued a Biological Opinion and Incidental Take Statement

(Ex. 92) that requires TMPP to conduct a study to help determine the extent of avian collisions of bald eagle, spotted owl and waterfowl use areas. If bird fatalities in excess of permit requirements are documented and attributed to collisions with conductors, remedial actions such as the installation of bird flight diverters will be implemented. (See Condition **BIO-9**.) (Ex. 65, p. 45.)

Cumulative Impacts. The Burney Valley is a rural setting with few industrial developments and residential neighborhoods centered around Burney and Johnson Park. Other new developments planned for the area are discussed in the **Land Use** section of this Decision. The power plant site will be located on an existing industrial site. Wildlife use of the immediate vicinity surrounding the proposed power plant site is primarily deer, raptors, coyotes, and lagomorphs. The loss of approximately 19 acres of ponderosa pine habitat will not cause a significant cumulative impact. The existing transmission line crosses several habitats that support numerous sensitive species. Reconductoring activities will not result in new towers and, if avoidance measures are implemented, will not result in cumulative impacts. (Ex. 65, pp. 45-46.)

Staff found the cumulative impacts from the proposed increase in consumptive use of water from the Burney aquifer difficult to quantify. The aquifer relies solely on precipitation for recharge. Staff assumed that the project impacts are proportional to the total volume of basin discharge. (Ex. 65, p. 46.) Staff's Errata to their testimony (see 12/19 RT 180) asserts that during summer months in *normal hydrologic years*, current consumptive use reduces the outflow in the Burney Basin by 34% and that TMPP's proposed use would increase the consumptive use by 3%. Staff concludes that this 3% increase is not significant and therefore not an adverse impact to the spring biota, but the impact is much greater during drought conditions. Ex. 65, Errata p. 46.) Staff concluded that TMPP's water use in drought years would adversely contribute to a significant situation of low groundwater supply, thereby exacerbating an already stressed ecosystem. (*Ibid.*)

In Staff's view, the existing conditions in the Burney watershed are significantly altered during prolonged drought conditions. Further reductions in groundwater by TMPP water use during prolonged drought could accelerate or prolong periods of reduced or ceased flow in springs in the area. This impact is a potentially significant cumulative impact depending on the severity of the drought. The Burney spring ecosystem is unique and represents one of the largest spring systems in the United States. Threats to this ecosystem alone could be significant. The springs support several aquatic species, many entirely dependent on the smaller flowing springs. Reductions in flow result in reductions in aquatic habitat, higher water temperatures, and increased siltation from the lack of filtration. Habitat requirements of the aquatic-dependent species are cool, clear springs, and many require cobblestone substrates with little or no siltation. Therefore, reduction in spring flows would significantly threaten these species. Because these spring habitats are small and isolated, resulting in island populations that are at a higher risk of local extinction, the potential for significant impacts is elevated. (Ex. 65, pp. 46-47.)

The springs that are known to be directly linked to the Burney basin aquifer support *potential* habitat for the highly endangered Shasta crayfish⁴¹. The U.S. Fish and Wildlife Service (USFWS) consider these springs to be important for the long-term recovery of Shasta crayfish. Staff believes (and Applicant disputes) that there could be a hydrologic link between the Burney and Hat Creek aquifers and that Crystal Lake springs could also be threatened by additional consumptive use of groundwater. Crystal Lake supports one of the seven remaining population centers of Shasta crayfish. Threats to this spring would be a significant cumulative impact in that it has the potential to adversely affect a state and federally listed species. (Ex. 65, p. 47, modified by Errata 12/19 RT 181.)

⁴¹ We note that surveys to confirm the actual presence or absence were not conducted by any party. (12/19 RT 6-7; Ex. 84, Biological Resources Testimony, p. 16.)

Mitigation Measures.

Applicant, Staff and the other parties and agencies worked together to develop general mitigation measures to avoid or reduce impacts to biological resources from construction of the power plant and from reconductoring activities. Applicant developed a draft Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) that provides more detail for implementing mitigation measures. Staff and USFWS reviewed the draft and provided comments to the applicant. (Ex. 65, p. 48.) A final BRMIMP is required by Condition **BIO-4**. These general mitigation measures include:

- Locate laydown areas on disturbed sites and at least 100 feet away from sensitive resource areas
- Minimize construction corridor widths
- Mark and avoid sensitive resource areas
- Restrict traffic to designated roads
- Brief contractors on location of construction zone boundaries and other mitigation measures
- Control erosion and sedimentation
- Preserve and, within two weeks, replace six inches of topsoil in temporary construction areas
- Recontour in disturbed areas and re-seed with a grass mixture
- Inspect open trenches for entrapped wildlife each morning and before re-filling with soil
- Provide a qualified biologist to monitor construction activities
- Conduct compliance inspections once a week
- Provide annual compliance reports and a post construction report 45 days after the project is completed
- Develop a Raptor Management Plan for reconductoring activities along the existing transmission line
- Design transmission lines to reduce risk of avian electrocution
- Conduct activities between mid-August and December to avoid the raptor nesting season
- Implement measures to reduce avian collisions in the event that the incidence of avian collision is considered unacceptable by USFWS.

- Preserve existing tower nests whenever feasible
- Conduct preconstruction surveys at pull sites and delineate avoidance and buffer zones around sensitive plant populations and wetland habitats.
- Travel only on existing access roads. Prohibit vehicles from entering any stream, river, or creek bed.
- Prohibit addition or removal of any dredge material to or from wetlands
- Restrict pull site locations to disturbed areas, chaparral or grassland habitats under the existing transmission line corridor. Avoid wetlands and other sensitive resource areas
- Provide a biological monitor knowledgeable in botany and raptor biology during all times of construction activities
- Treat the pull site locations with soil stabilizers and reseed with native forbs and grasses. (Ex. 65, pp. 48-49.)

The operation of the power plant during the drought periods will contribute to reduced spring flow and greater environmental stress on both the Shasta Crayfish and aquatic/terrestrial mollusks. Staff found this reduction in spring flow constitutes a potential significant cumulative impact that required mitigation. Staff considered a wide range of mitigation, including dry cooling, the purchase of water use “off-sets” from agricultural uses, and research and protective projects to assist the recovery and protection of both the crayfish and the mollusks. During negotiations with CURE and the State Department of Parks and Recreation, the applicant agreed to a substantially reduced water use and mitigation measures. Although this reduction in water use through a hybrid wet/dry cooling is commendable and greatly reduces potential impacts, the new pumping is still a potential significant cumulative impact requiring further mitigation. (Ex. 65, p. 49.)

In Staff’s view, the proportionate and appropriate mitigation for these potential impacts, considering the uncertainties associated with them, are measures that contribute to the long-term scientific understanding and potential recovery of these species. The long and short-term benefits from the information gained by these studies are seemingly proportionate to the potential cumulative impacts from the project’s use of groundwater. (Ex. 65, p. 49.) Staff originally proposed

such mitigation. (Ex. 65, pp. 50-51.) Applicant proposed similar mitigation, even while continuing to assert there was no significant impact. (Ex. 84, Biological Resources Testimony, pp. 14-17, 20-21.)

These parties, after the filing of written testimony, entered into a “stipulation”⁴² regarding Water Resources and Biological Resources⁴³. (See Ex. 79.) This stipulation was intended to clarify and confirm certain areas of agreement between Staff and TMPP regarding the potential direct impacts and potential cumulative impacts of the Project in the areas of Soils & Water Resources and Biological Resources. This stipulation reflects agreement reached between Staff and TMPP regarding what they believed to be the appropriate mitigation for certain potential impacts in the area of Biological Resources. That mitigation includes a Shasta Crayfish barrier study and a study of aquatic and terrestrial mollusks, both of which are described in *Exhibit A* to the Stipulation. (*Ibid.*)

One agreement with respect to the project’s impact on water resources is that the “Project will not result in any significant direct impacts to spring flows or to Burney Falls.” (*Ibid.*) Also included in this stipulation were statements that each party still believed that their respective analyses about impact are technically sound, but they **agreed** that there is some inherent uncertainty in any predictive analyses of future hydrological impacts due to the nature of the analyses. They further agreed, as we do, that this uncertainty supports a finding that it is appropriate to require funding for mitigation measures that addresses the overall potential cumulative impact on biological resources. (*Ibid.*) Their agreement on appropriate mitigation, that we adopt, is shown below in Conditions **BIO-19 and BIO-11**.

⁴² This “stipulation” did not involve any of the other parties and they are not bound by it.

⁴³ For a discussion of the implications of this stipulation on Biological Resources, see that section of this Decision.

COMMISSION DISCUSSION

Although the reductions in flow caused by the project could adversely affect endangered and sensitive species, the mitigation agreed to by Staff and Applicant will effectively mitigate any such impacts. As noted by the parties, this approach to cumulative impact mitigation is recommended by §15130 (a)(3) of the State CEQA Guidelines as a factual basis for determining that a project's contribution to a cumulative impact is not cumulatively considerable and thus is not significant. This mitigation is conservative and appropriate in a situation such as this where there is a possible or uncertain significant cumulative impact. (See Ex. 79.) In its testimony on biological resources, Staff evaluated the reductions in flows it identified in its water testimony as being attributable to the project. Staff concluded that these reductions **could** represent a substantial contribution to a significant cumulative impact. Staff based its conclusion on several factors, including the possible hydrologic connection between the Burney aquifer and Crystal Springs, which is located in the Hat Creek aquifer and supports one of the seven remaining populations of Shasta crayfish, an endangered species. In addition, staff cited the fact that reductions in flow will affect springs within the Burney Basin that are *potential* Shasta crayfish habitat and also support US Forest Service sensitive species, federal species of concern, and state species of special concern. (Ex. 65, pp. 47–48.)

In contrast, Applicant testified that the reductions in flow identified in its water testimony (which are considerably smaller than those identified by staff) would *not create any* significant impacts to sensitive species or the Shasta crayfish in the Burney basin. (Ex. 84, pp. 14–16.) Applicant did not evaluate any impacts to Shasta crayfish populations in Crystal Lake. (*Id.*, p. 21) Nevertheless, the applicant and staff entered into a stipulation acknowledging the uncertainty of predictive analyses of future hydrologic impacts, and agreed that the mitigation recommended by staff for impacts to biological resources is appropriate. (Ex. 79.)

BRG disagrees with this mitigation and stipulation, stating that insufficient data is available to determine the likely impacts of the project on water-dependent biota. (Ex. 82.) BRG recommends that the project be required to use dry cooling exclusively. (*Ibid.*) BRG's testimony, however, does not include the expert opinion of any sworn witness⁴⁴ on hydrology. Its claims of insufficiency of the data are, therefore, given less weight than the testimony of both Staff and Applicant on this point.⁴⁵ The studies that were conducted, in the Applicant's opinion, "provide a good understanding of the hydrogeology of the area" and "form a clear basis for the assessment of the biological conditions of the area and possible impacts from proposed pumping." (Ex. 69, Biological Resources Rebuttal Testimony, p. 5.)

We believe evidence demonstrates that the completion of the barrier studies is critical to the recovery of the Shasta crayfish, as it should result in the design of barriers to the predatory, invasive Signal crayfish. (Ex. 65, p. 50.) As a result, this measure should help not only Shasta crayfish living in areas directly affected by the project, but other populations as well. This measure will assist to alleviate the concerns of BRG's expert on the subject of the Shasta crayfish, Ms. Ellis, who found the Signal crayfish to be "the greatest current threat" to the Shasta crayfish. 12/19 RT 10-11.)

⁴⁴ The opinions and conclusions drawn by Dr. Fox, in this or any other proceeding are not evidence in this proceeding because she was not a sworn witness, subject to cross-examination. The extent to which Dr. Ellis and Mr. Cook relied on those opinions and conclusions does not elevate their status as evidence. BRG's reliance on Dr. Fox in its Briefs in this matter is unjustified.

⁴⁵ We note, in contrast, the testimony of one of TMPP's experts, Mr. Sheahan, who testified that there is a greater level of study and analysis in this record than is usually available when the water resource impacts of a project are being evaluated. (Ex. 69, Sheahan Rebuttal Soil and Water Resources Testimony, p. 11.) The information and studies utilized by TMPP came from state, local and federal agencies and from published and unpublished reports from experts in the field. (*Ibid.*) The water resources studies conducted by TMPP alone cost nearly \$700,000. (Ex. 69, Soil and Water Resources Testimony, p. 1.)

In addition, the study of aquatic and terrestrial mollusks is critical to developing an understanding of these species, including habitat requirements, and size of populations. (Ex. 65, pp. 50–51) Without that information, no governmental agency charged with protecting biological resources can determine what steps should be taken to conserve these species.⁴⁶

Both mitigation measures will effectively ameliorate the impacts created by the Project's use of groundwater. Staff and TMPP experts agree that, with these conditions, the Project will not have any unmitigated significant adverse impacts on biological resources and will comply with applicable LORS in the area of Biological Resources. (See Ex. 65, p. 52; Ex. 84, Biological Resources Testimony, p. 25; Ex. 79, pp. 1-2.)

Closure

The anticipated life expectancy of power plants is 30 years. Planned or unexpected closure must adhere to measures that ensure no significant impacts to biological resources. The applicant must develop an on-site contingency plan to address facility closure and include this plan in the BRMIMP. The proposed power plant will be built on a site that is currently disturbed. The linear pipelines will be re-vegetated, and impacts associated with their construction are temporary. The existing transmission line will service projects in addition to the TMPP. Therefore, a contingency plan need only address hazardous materials and decommissioning of the new transmission line. No impacts to biological resources should occur in the event of temporary facility closure. Therefore, no mitigation measures are required. (See further discussion under "General Conditions for Facility Closure" in the **Compliance and Closure** section of this decision.)

⁴⁶ We note here that the Final Biological Opinion has been issued by the USFWS. (Ex. 92.) That Opinion discusses the effect of this Project on the Shasta crayfish in great and accurate detail. The conclusion of the USFWS is that with the mitigation proposed, the Project "is not likely to jeopardize the continued existence of the Shasta crayfish." (*Ibid.*, at p. 29.)

FINDINGS AND CONCLUSIONS

Based on the evidence of record, we make the following findings and conclusions:

1. The project region has been historically used for agriculture and urbanization, although the project site, itself, is an industrial one.
2. Biotic communities in Burney Valley include ponderosa pine forest, volcanic talus, freshwater marsh, montane chaparral, and annual grasslands.
3. The Burney aquifer is composed of fractured lava flows and groundwater emerges as clear, cold water springs. This unique ecosystem is one of the largest spring systems in the United States. The springs provide unique habitat for many sensitive and listed species.
4. Loss of sensitive species and sensitive species habitat in the region is the primary concern of the local, state, and federal agencies that monitor biological resources.
5. Project specific direct impacts will result in the permanent loss of 18.78 acres of ponderosa pine habitat and the temporary loss of 0.77 acres of grassland habitat.
6. These habitat loss impacts are not significant and no mitigation or habitat compensation is appropriate.
7. Applicant will provide payment of \$250,000 to the CPM, which will be deposited in a state-managed account, set up specifically to fund a Shasta crayfish (*Pacifastacus fortis*) barrier study. Implementation of the study shall be overseen and managed by the CPM..
8. Applicant will provide \$100,000 to the CPM, which will be deposited in a state-managed account, set up specifically to fund a study of aquatic and terrestrial mollusks that reside in the Burney Basin area. The study shall focus on distribution, abundance, taxonomy, or life history requirements of aquatic and terrestrial mollusks.
9. Applicant's habitat compensation package is consistent with the U.S. Fish and Wildlife Service (USFWS) requirements for impacts to listed species habitat.

10. To the extent feasible, Applicant will implement measures to avoid sensitive biological resources.
11. Applicant has obtained a Section 7 Biological Opinion from the USFWS,

TMPP's potential direct, indirect, and cumulative impacts will be adequately mitigated by the measures specified in the Conditions of Certification listed below. The Commission therefore concludes that implementation of the Conditions of Certification will ensure the project conforms with all applicable laws, ordinances, regulations, and standards related to biological resources and that all potential adverse impacts to biological resources will be mitigated to levels of insignificance.

CONDITIONS OF CERTIFICATION

BIO-1 Site modifications including ancillary facilities preparation shall not begin until an Energy Commission CPM approved Designated Biologist is available to be on site.

Protocol: The Designated Biologist must meet the following minimum qualifications:

1. a Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;
2. three years of experience in field biology;
3. one year of field experience with biological resources found in or near the project area including the plant and raptor species and wetlands; and
4. an ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for the biological resources tasks that must be addressed during project construction and operation.

If the CPM determines the proposed Designated Biologist to be unacceptable, the project owner shall submit another individual's name and qualifications for consideration. If the approved Designated Biologist needs to be replaced, the project owner shall obtain approval of a new Designated Biologist by submitting to the CPM the name, qualifications, address, and telephone number of the proposed replacement. No disturbance will be allowed in any designated

sensitive areas until the CPM approves a new Designated Biologist and the new biologist is on site.

Verification: At least 60 days prior to the start of any site mobilization activities, the project owner shall submit to the CPM for approval, the name, qualifications, address and telephone number of the individual selected by the project owner as the Designated Biologist. If a Designated Biologist is replaced, the information on the proposed replacement, as specified in the condition, must be submitted in writing at least ten working days prior to the termination or release of the preceding Designated Biologist.

BIO-2 The CPM approved Designated Biologist shall perform the following during project construction and operation:

1. advise the project owner's Construction Manager on the implementation of the Biological Resource Conditions of Certification;
2. supervise or conduct surveys, mitigation, daily monitoring and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as, wetlands and special status species;
3. prohibit workers and vehicles from entering or disturbing designated sensitive areas or creeks, rivers, and streams; and
4. notify the project owner and the CPM of any non-compliance with any Biological Resources Condition of Certification.

Verification: During project construction, the Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted along with the Monthly Compliance Reports to the CPM. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

BIO-3 The project owner's Construction Manager shall act on the advice of the Designated Biologist to ensure conformance with the Biological Resources Conditions of Certification.

Protocol: The project owner's Construction Manager shall halt, if necessary, all construction activities in areas specifically identified by the Designated Biologist as sensitive to assure that potential significant biological resource impacts are avoided.

The Designated Biologist shall:

1. inform the project owner and the Construction Manager when to resume construction, and
2. advise the CPM if any corrective actions are needed or have been instituted.

Verification: Within two working days of a Designated Biologist notification of non-compliance with a Biological Resources condition of certification or a halt of construction, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem or the non-compliance with a condition. For any necessary corrective action taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION & MONITORING PLAN

BIO-4 The project owner shall submit to the CPM for review and approval a copy of the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and, once approved, shall implement the measures identified in the plan.

Protocol: The final BRMIMP shall identify:

1. all Biological Resource Conditions included in the Commission's Final Decision;
2. protocols for conducting botanical, dead bird, and raptor nest surveys along the existing transmission line;
3. provisions for mitigating avian collision, if applicable;
4. a list of all terms and conditions of USFWS biological opinion and any CDFG or USFS requirements or recommendations;
5. a detailed description of measures, Best Management Practices, and take avoidance measures that will be implemented to avoid and/or minimize impacts to sensitive species and reduce habitat disturbance;
6. all locations, on a map of suitable scale, of laydown areas and areas requiring temporary protection and avoidance during construction;
7. aerial photographs (scale 1:200) of all pull sites- one set prior to site disturbance and one set after project construction- showing locations of sensitive areas. Include planned timing of aerial photography and a description of why times were chosen;
8. a raptor management plan and re-vegetation plan;
9. duration for each type of monitoring and a description of monitoring methodologies and frequency;

10. performance standards to be used to help decide if/when proposed mitigation is or is not successful;
11. all performance standards and remedial measures to be implemented if performance standards are not met;
12. a discussion of biological resource-related facility closure measures; and;
13. a process for proposing plan modifications to the CPM and appropriate agencies for review and approval.

Verification: At least 45 days prior to start of site mobilization activities, the project owner shall provide the CPM with the final version of the BRMIMP for this project, and the CPM will determine acceptability of the plan. The project owner shall notify the CPM five (5) working days before implementing any CPM approved modifications to the BRMIMP.

Within 30 days after completion of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which mitigation and monitoring plan items are still outstanding.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

BIO-5 The project owner shall develop and implement a CPM approved Worker Environmental Awareness Program in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or related facilities during construction and operation, are informed about sensitive biological resources associated with the project.

Protocol: The Worker Environmental Awareness Program must:

1. be developed by the Designated Biologist and consist of an on-site or training center presentation in which supporting written material is made available to all participants;
2. discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
3. present the reasons for protecting these resources;
4. present the meaning of various temporary and permanent habitat protection measures; and
5. identify whom to contact if there are further comments and questions about the material discussed in the program.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program materials. The person administering the program shall also sign each statement.

Verification: At least 60 days prior to the start of site mobilization, the project owner shall provide copies of the Worker Environmental Awareness Program, all supporting materials, and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. The signed statements for the construction phase shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six months after the start of commercial operation. During project operation, signed statements for active project operational personnel shall be kept on file for the duration of their employment and for six months after their termination.

AGENCY COMPLIANCE

BIO-6 Prior to the start of any site mobilization activities, the project owner shall acquire a Biological Opinion and Incidental Take Statement from the U.S. Fish and Wildlife Service and a letter from the California Department of Fish and Game that permits are not required from that agency for the construction and operation of the Three Mountain Power Project and implement any terms and conditions of those agencies.

Verification: No less than ninety days prior to the start of any site mobilization activities, the project owner shall submit to the CPM a copy of the final Biological Opinion and Incidental Take Permit from the U.S. Fish and Wildlife Service and a copy of a letter from the California Department of Fish and Game stating that permits from that agency are not required for this project. Any terms and conditions in the Statement and letter shall be incorporated into the final Biological Resources Mitigation Implementation and Monitoring Plan.

BIO-7 Prior to start of any site mobilization activities on Forest Service land, the project owner shall obtain a letter from Shasta National Forest stating their approval of construction activities that will occur on Forest Service lands and implement any terms and conditions.

Verification: No less than ninety days prior to the start of any site mobilization activities on Forest Service land, the project owner shall submit to the CPM copies of the letter from the Shasta National Forest and incorporate any terms and conditions into final Biological Resources Mitigation Implementation and Monitoring Plan.

PRECONSTRUCTION SURVEYS

BIO-8 Prior to start of any reconductoring activities, the project owner shall conduct surveys for sensitive plant species during the appropriate blooming period and concomitant surveys for dead birds and raptor nests along the existing transmission line corridor. Locations of sensitive plant populations and wetlands shall be delineated and avoided by construction activities.

Verification: No less than thirty days prior to the start of any reconductoring activities, the project owner shall submit to the CPM a report of results from the plant, bird, and nest surveys. The report shall specify and map locations of sensitive resources and bird fatalities, and discuss avoidance measures and any necessary remedial actions.

GENERAL MITIGATION

BIO-9 The project owner shall implement the following mitigation measures and incorporate these into the BRMIMP.

PROJECT SITE

1. Minimize width of construction corridor to 50 feet for pipelines and 200 feet for the new transmission line corridor.
2. Design and locate staging areas and access/construction roads to disturbed areas whenever possible and at least 100 feet away from areas supporting sensitive species.
3. Construction area boundaries will be clearly delineated by flagging or fencing to minimize disturbance to natural habitat.
4. Control erosion and sedimentation by conducting construction activities during dry periods, and by using silt fences, sandbags, and detention basins.
5. Preserve and, within two weeks, replace topsoil from areas temporarily impacted. Replaced topsoil will be decompacted to a depth of 18 inches. Original grades will be restored with a minimum of 6 inches of topsoil.
6. Re-vegetate linear corridors with native seed mixtures.
7. Restrict traffic to established roads, designated access roads, construction areas, storage areas, staging areas or parking areas.
8. Inspect open trenches for wildlife prior to start of daily construction activities. Any wildlife observed will be allowed to escape on its own. If necessary, ramps and side exits will be placed in the trench every 0.25 mile.

TRANSMISSION LINE RECONDUCTORING

1. Prohibit the removal or addition of dredge material into any wetlands.
2. Prohibit vehicles from entering any stream, river, or creek bed.
3. Restrict pull site locations to disturbed areas, previously cleared areas such as chaparral or grassland habitats lacking vernal pools, wetlands, or sensitive plant populations.
4. Treat all pull sites with soil stabilizers and native seed treatments to reduce erosion
5. Conduct reconductoring activities only from mid-August through December to avoid the raptor nesting season.
6. Conduct a raptor and waterfowl collision study approved by USFWS.
7. Provide a biological monitor knowledgeable in raptor biology and botany during all times of construction activity.
8. Design transmission line to reduce collision and electrocution risk.
9. Preserve existing tower nests whenever feasible.

Verification: During project construction, the project owner shall provide monthly compliance reports stating activities completed, mitigation measures implemented, sensitive biological resources areas encountered, raptor nests removed, and any infractions by construction personnel. Within thirty days after completion of the project construction, the project owner shall submit a post-construction compliance report that describes the following details: dates that construction occurred; data concerning success in meeting project mitigation measures; known project effects on any sensitive species encountered during the construction phase; an assessment of the extent and severity of project impacts on all sensitive wildlife habitats; and other appropriate information.

SHASTA CRAYFISH BARRIER STUDY

BIO-10 Prior to the start of any site mobilization, the project owner shall provide payment of \$250,000 to the CPM which will be deposited in a state-managed account set up specifically to fund a Shasta crayfish barrier study, as described in Appendix C of the *Recovery Plan for the Shasta Crayfish (Pacifastacus fortis)* (USFWS 1998). Implementation of the study shall be overseen and managed by the CPM.

The study shall be awarded by the CPM, in consultation with U.S. Fish and Wildlife Service, to a research entity that can demonstrate it possesses the experience to successfully implement and complete the study and that has or will have necessary permits required by state and federal laws to conduct the study.

Upon completion of the study, all reports and other final work products shall be delivered to the CPM, U.S. Fish and Wildlife Service, and California Department of Fish and Game and shall be publicly available.

Verification: Within one day prior to the start of any site mobilization, the project owner shall submit to the CPM payment of \$250,000 for deposit into a state-managed account set up to fund the Shasta crayfish barrier study. The CPM shall make every effort to have the research entity identified no later than nine months after site mobilization.

AQUATIC AND TERRESTRIAL MOLLUSKS STUDY

BIO-11 Prior to the start of any site mobilization, the project owner shall provide \$100,000 to the CPM which will be deposited in a state-managed account set up specifically to fund a study of aquatic and terrestrial mollusks that reside in the Burney Basin area. The study shall focus on distribution, abundance, taxonomy, or life history requirements of aquatic and terrestrial mollusks, including those identified in Biological Resources Table 1.

The scope of work including reporting requirements shall be developed by the CPM in consultation with U.S. Fish and Wildlife Service and U.S. Forest Service. Implementation of the study shall be overseen and managed by the CPM. Upon completion of the study, all reports and other final work products shall be delivered to the CPM, U.S. Fish and Wildlife Service, U.S. Forest Service, and California Department of Fish and Game and shall be publicly available.

Verification: Within one day prior to the start of any site mobilization, the project owner shall submit to the CPM payment of \$100,000 for deposit into a state-managed account to fund the mollusk study. The CPM shall make every effort to have the research entity identified no later than nine months after site mobilization.

FACILITY CLOSURE

BIO-12 The project owner will incorporate into the planned permanent or unexpected permanent closure plan measures that address the local biological resources. The biological resource facility closure measures will also be incorporated into the TMPP project BRMIMP.

Protocol: The planned permanent or unexpected permanent closure plan will require the following biological resource-related mitigation measures:

1. removal of transmission conductors when they are no longer used and useful; and
2. measures to restore wildlife habitat to promote the re-establishment of native plant and wildlife species.
3. measures to remove all toxic and hazardous materials from the site.

Verification: At least 12 months (or a mutually agreed upon time) prior to the commencement of closure activities, the project owner shall address all biological resource-related issues associated with facility closure in a Biological Resources Element. The Biological Resources Element will be incorporated into the Facility Closure Plan, and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

D. SOIL AND WATER RESOURCES

This section reviews the soil and water resources associated with the project, specifically focusing on the project's potential to induce erosion and sedimentation, adversely affect surface and groundwater supplies, degrade water quality, and increase the likelihood of flooding. Other flooding and drainage issues are addressed in the **Geology and Paleontology** section of this document. The analysis also considers the potential cumulative impacts to water quality in the project vicinity. To prevent or reduce any potential adverse impacts, several mitigation measures are included in the Conditions of Certification to ensure that the project will comply with all applicable federal, state, and local laws, ordinances, regulations, and standards (LORS).

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Soils

The Three Mountain Power Project is located in eastern Shasta County, California. The proposed facilities are located approximately 45 miles east of Redding, and approximately 1 mile northeast of the town of Burney. Agriculture, agricultural lands, and timber production are a major component of Shasta County's resource base. Approximately 50% of the county is dedicated to commercial forest use and approximately 15.5% is dedicated to agricultural uses. The project area is located in what is characterized by Shasta County as a "large mountain meadow," specifically in Burney Creek Valley. The County's large mountain meadows are located 3,000 feet above Mean Sea Level (MSL). Portions of these meadows are irrigated and are used for grazing and crops. Many of these lands are under Williamson Act contracts. (Ex. 1, § 6.15.1.)

The predominant soils⁴⁷ in the project area are loams and clay loams. Representative soils in the project area include the Burney loam/clay loam (soil mapping unit number 7201) and Arkright loam/gravelly clay loam (soil mapping unit 7202). Minor soil classes in the project vicinity include large cultivated areas (soil mapping unit number 100), and areas of rubble land (90 to 100 percent stones and boulders) (mapping unit number 700) (CSVs 1979). The Burney loam/clay loam is composed of moderately deep to deep, well-drained, brown to reddish brown loam/clay loam. Burney soils have moderate permeability and low shrink-swell potential. Burney clay loam soils occur on nearly level to strongly sloping slopes and are derived from basic igneous rocks (basalts). The Arkright gravelly clay loam consists of moderately shallow to moderately deep, well-drained soil with moderate permeability and low shrink-swell potential. Arkright soils form from basic igneous rocks. Both the Burney clay loam and Arkright gravelly clay loam soils are only slightly susceptible to water erosion and have a low susceptibility to wind-induced soil erosion. (Ex. 1, § 6.15.1.1.) Further discussion of the soils and subsurface of the Project area is contained in the **Geological and Paleontology** section of this Decision.

The 10.2-acre Site is situated in the Burney Valley, on undifferentiated Pleistocene basaltic lava flows. The site is generally flat and is located at an elevation of approximately 3,140 feet MSL. Vegetation on the Site is sparse, but in areas consists of nonnative grassland and weedy species. Soil present at the Site is Burney loam/clay loam (7201). The characteristics of the Burney soils are described above. The Burney loam is only slightly susceptible to water erosion and has only slight limitations for development of small buildings and roads due to the shallow depth to rock, the presence of large stones, and restricted permeability (for septic leach fields. (Ex. 1, § 6.15.1.1.1.)

⁴⁷ The soil resource information presented in this section is based primarily on the Soil-Vegetation Map and Tables prepared by the California State Cooperative Soil-Vegetation Survey (CSVs), a research unit of the Pacific Southwest Forest and Range Experiment Station of Berkeley, California, dated 1979. The information was compiled by Applicant in the AFC.

Land uses in the project area include agricultural, timber production, residential, industrial (existing power plant and sewage treatment plant), and undeveloped. Additional information is contained in the **Land Use** section of this decision. The proposed Site does not involve agricultural lands but the natural gas tie-in line route traverses through privately owned property used for timber production. (Ex. 1, § 6.15.1.2.1.)

Based on information obtained from the California Department of Forestry and the USDA, Applicant testified that the proposed project soils (Burney soils) are not considered prime farmland and based on information obtained from the Resource Conservation Service the project area is not considered Prime Farmland, farmland of “statewide importance,” or “unique” farmland. (Ex. 1, § 6.15.1.2.2.)

Applicant’s assessment of project impacts to soil resources is based primarily on soils information presented in the 1979 Soil-Vegetation Map and Tables prepared by the Pacific Southwest Forest and Range Experiment Station. Additional information was obtained from the USDA. Impacts to the soil resource could be significant if construction activities were to occur in areas of high erosion susceptibility and the disturbed areas were left exposed and not properly stabilized and/or revegetated. Impacts to soil resources could also be significant if the project were to alter land with special designations (e.g., Prime Farmland) to the point that the disturbed area would no longer exhibit the inherent characteristics of the special designation. (Ex. 1, § 6.15.2.1.)

Soil erosion by water is considered slight and wind erosion is considered negligible at the site. The effects of erosion will be reduced even more following development. The Site will be leveled, covered with concrete and gravel, and will contain drainage systems. Calculations of soil loss were not considered appropriate and thus were not performed. Anticipated soil erosion during and after construction will, however, be minimized through implementation of

standard erosion control measures described in the Conditions of Certification. Construction of the Three Mountain Power Facility will require earthwork in order to prepare the 10.2-acre site. Excavation work will consist of the removal, storage, and/or disposal of earth, sand, gravel, vegetation, organic matter, loose rock, boulders, and debris to the lines and grades necessary for construction. Materials suitable for backfill will be stored in stockpiles at designated locations using proper erosion protection methods. Excess material will be removed from the site and disposed of at an appropriate landfill. The existing site topography is generally level. The drainage system will be designed in accordance with Shasta County guidelines. Site drainage will be routed to a proposed storm water retention pond. Graded areas will be smooth, compacted, free from irregular surface changes, and sloped to drain. Final grading of the Site will include concrete or asphalt surfaces, except for very limited landscaped areas. Access roads to and within the Site will be paved. (Ex. 1, § 6.15.2.1.1.)

The proposed Three Mountain Power Site is currently flat, graded, unpaved, and undeveloped land that is used partially to store wood chips for the adjacent Burney Mountain Power (BMP) plant. Vegetative cover is kept minimal for fire prevention purposes. Currently, very little vegetative cover is present on the Site. Grading operations to develop the Facility will result in alteration of the existing soil profiles. Alteration of the existing soil profiles, including mixing soils and rock, will alter the physical, chemical, and biological characteristics of the native soils and underlying geology. Because the Site is currently an unpaved, unimproved dirt lot, subsequent soil disturbance associated with construction will likely not result in a significant increase in water and wind erosion rates. Once constructed, the proposed Project design includes measures to control drainage. These design measures are expected to limit erosion/sedimentation to acceptable levels. (Ex. 1, § 6.15.2.1.2.)

Construction vehicle and equipment use on disturbed soils at the site may temporarily increase wind erosion rates at the Site and the adjacent construction

laydown area located on the existing power plant site. Approximately 1.7 acres of land adjacent to the existing Burney Mountain Power plant site will be used for construction laydown, construction parking, and tool and equipment storage. Impacts to these areas include soil disturbance and soil compaction. Wind and water erosion rates at the laydown areas are expected to temporarily increase due to surface disturbance and compaction. Tracking of soil onto State Route 299 from construction vehicles will be minimized by adhering to standard erosion control measures. (*Ibid.*)

Following construction, wind and water erosion on the Site will be reduced because the Site will be compacted and covered with concrete and/or aggregate, and drainage will be controlled through a storm water retention basin. Implementation of the project-related construction measures is expected to limit impacts to the soil resource at the site to acceptable levels. Operation of the gas turbines will expose soils and vegetation to increased levels of air pollutants, as discussed in the Air Quality section of this Decision, but soil impacts associated with deposition of air pollutants will be insignificant. (*Ibid.*)

The project owner will implement permanent measures to prevent erosion including drainage and infiltration systems, slope stabilization, and revegetation. Condition **SOIL&WATER-2** requires the project owner to submit a final Erosion Control and Revegetation Plan prior to commencement of any ground-moving activities.

The plant is configured as a zero-liquid discharge (ZLD) power plant. This project as now designed does not require Waste Discharge Requirements (WDRs) because no wastewater will be discharged. (Ex. 65, pp. 65, 96.) Through the use of a brine concentrator and a crystallizer all water will be recovered for reuse within the plant and all constituents contained in the supply water will be concentrated and removed as solids and disposed of at a landfill. (Ex. 65, p. 103.) All chemicals will be stored, handled, and used in accordance with best

management practices.⁴⁸ Condition **SOIL&WATER-1** requires the project owner to develop and implement a Storm Water Pollution Prevention Plan (SWPPP).

1. Floodplain Assessment

Shasta County lists the Site as Zone C, which indicates it is not located in a special flood hazard area. No water inundation zones have been identified for the site and the Project is not located in a 100-year flood plain or tsunami run-up zone. No special flood protection is required for construction or operation of the Project beyond the proposed drainage basin. In addition, the Project construction and operation should not increase flooding potential of properties downstream because it is not located in a water inundation zone and the detention basin will be sized to contain all site runoff. (Ex. 1, §. 6.14.1.3.)

2. Hydrology

There are no significant surface water bodies in the vicinity of the site. (Ex. 1, §. 6.14.1.3.) There are three principal drainage basins in the vicinity of Burney: the Burney Basin, the Hat Creek Basin, and the Pit River Basin. (Ex. 84, Water Resources Testimony, p. 5.) The project is located within the Burney Basin. The boundary of the Burney Basin is the boundary of the surface drainage area (or watershed) that is tributary to Burney Falls. The area of the basin is approximately 182 square miles. The Burney Basin is bounded on the west by Hatchet Peak, Clover Mountain, and the other mountains of the Cascade Range; on the south by Dan Hunt Mountain and other associated high lands; on the east by Crater Peak, Burney Mountain, and Brush Mountain; and on the north by the drainage of the Pit River. Surface water within the basin flows to Burney Creek. Burney Creek is the major drainage system in the Burney Basin. This stream originates in the higher-elevation areas in the south end of the basin near Dan

⁴⁸ See the Hazardous Materials Management section of this Decision.

Hunt Mountain, flows generally north, and discharges at Burney Falls at the northernmost end of the basin. The applicant asserts the average annual discharge of Burney Creek is about 29,000 AFY, based on measurements near the town of Burney. Within the Burney Basin are several lesser creeks that drain into Burney Creek. Among these are the smaller streams that flow from Burney Mountain in the southeastern part of the basin, streams that flow from the Hatchet Peak area in the west, and streams draining Goose Valley in the northwest portion of the basin. The total flow in Burney Creek is made up of the sum of the flows from these tributary streams and the flow in the main Burney Creek channel. (Ex. 84, Water Resources Testimony, pp. 5-6.)

To understand the groundwater conditions of Burney Basin, it is important to understand the groundwater flow system in the Hat Creek Basin to the east and south. The boundary of the Burney Groundwater Basin is approximately the same as the drainage basin boundary. The geology of the Burney Basin consists of older, less permeable basalt flows (Pliocene) in the western portion of the basin and younger, highly permeable basalt flows (Pleistocene) in the central and eastern portions. The younger basalt flows overlie older lakebed sediments that are much lower in permeability than the basalt. The principal water-bearing deposit in the Burney Groundwater Basin is the Burney Aquifer. This unit is made up of the saturated portion of the younger, more permeable (Pleistocene) basalt flows. The depth to the top of the water table, the top of the saturated portion of the Burney Aquifer, in the vicinity of the Project and the Burney Water District is about 240 feet. The thickness of the saturated portion of the highly-permeable basalt flow is about 250 feet. Groundwater enters this aquifer as infiltration of precipitation, principally from the mountainous areas around the edge of the basin, but also from infiltration of surface water in Burney Creek and the other surface streams. Groundwater flows generally north in the aquifer and discharges through springs at the northern end of the basin. The Applicant testified that the Burney basalt aquifer is separated from the Hat Creek basalt aquifer to the east by older Pliocene basalt deposits (e.g., outcrops at Brush

Mountain) and by a groundwater divide. The groundwater divide is a north-south zone delineated by an area of higher water-level elevations along the eastern boundary of the Burney Basin. Groundwater does not flow across a groundwater divide. Groundwater recharge on the west side of the groundwater divide flows generally west-northwest into the Burney Basin, while recharge to the groundwater on the east side of the groundwater divide flows generally east-northeast into the Hat Creek Basin. (Ex. 84, Water Resources Testimony, pp. 7-8.)

In contrast to the Applicant, staff believes that the geologic, isotopic and hydrologic evidence indicates that it is possible that groundwater does flow between Hat Creek Basin and Burney Basin. It is generally agreed that the topographic divide between the two basins is low and poorly defined with no geologic barrier to groundwater flow, except for Brush Mountain. Staff believes that the evidence of groundwater inflow from the Hat Creek to Burney Basin is indicated by the isotopic spring and groundwater studies conducted by Dr. Rose. Staff concluded that the groundwater measurements, collected by the Applicant and Dr. Fox, indicate that groundwater gradients could cause inflow to Burney Basin from Hat Creek Basin, south of Brush Mountain, and outflow from Burney Basin to Hat Creek Basin, north of Brush Mountain. Based on this analysis, staff concluded that it is possible that a connection between the two basins south of Brush Mountain exists, which could be significant since groundwater flow in this area feeds Crystal Lake springs and could affect the Shasta Crayfish. (Ex. 65, pp. 70, 87-88, and 119-122) Both Staff and Three Mountain Power believe that their respective analyses are technically sound; however, both parties agree that there is some inherent uncertainty in any predictive analyses of future hydrological impacts due to the nature of the analyses. Such uncertainty therefore supports a finding that it is appropriate to require funding for mitigation measures that address the overall potential cumulative impact on biological resources. (Ex. 79, p. 2)

Groundwater from the basalt aquifers in the Burney and Hat Creek Basins discharge water to the surface through several springs. Due to the nature of the

groundwater aquifers and the topography in the basins, basalt aquifer springs are the major natural points of groundwater discharge. These springs are fed by the main aquifer systems and tend to flow year round. All of the surface water and groundwater from the Burney Aquifer that is not consumed by natural evapotranspiration and human uses (municipal, industrial, agricultural) discharges from the basin through falls and springs at the north end of the basin. In Applicant's opinion, there is no contribution of water from the Hat Creek Basin to the Burney Basin. (Ex. 84, Water Resources Testimony, pp. 8-9.) Staff experts differ on this point. Dr. Rose maintains that *some* (his emphasis) of the groundwater discharge at Burney Falls originates from the Hat Creek Basin. (Ex. 65, p. 120; 12/18 RT 311.) This difference of opinion is not important to our Decision regarding impacts to Burney Falls because contribution from the Hat Creek Basin, if such exists, would only *lessen* the impact of this project on the water resources of the Burney Basin. However, if Crystal Lake is connected to the Burney aquifer system, it may be impacted by groundwater use in Burney basin. (See discussion in the **Biological Resources** section of this Decision.)

The discharge at Burney Falls includes both groundwater and surface water. Approximately 29,000 AFY of water from Burney Creek discharges at Burney Falls as surface water. In addition, a much larger amount of groundwater discharges from Burney Falls Springs as spring flow. The combined surface water and groundwater discharge flows into the pool at the bottom of the falls, and then drains into Lake Britton. Another group of major springs at the north end of the Burney Basin is Salmon Springs. This group of three springs discharges an average of about 17,000 AFY of groundwater from the Burney Aquifer, and the combined discharge flows downhill to Lake Britton. There are numerous other springs in the Burney Basin that occur in the higher elevation areas of the hills and mountains around the outer portion of the basin. These springs discharge at higher elevations than the groundwater level in the main Burney Aquifer, and contribute water to the surface drainage, some of which infiltrates to the main Burney Aquifer. Because these springs are at higher

elevations than the water table, they are not affected by extraction of water from the Burney Aquifer. Many of these smaller springs are fed by only small perched water systems and tend to dry up during times of low precipitation. (Ex. 84, Water Resources Testimony, p. 9.)

Both Staff and the Burney Resource Group (BRG) have significant differences with the Applicant's analysis, not the least being the contribution from the Hat Creek Basin described above. These differences, however, need not be adjudicated in any detail. Staff and Applicant entered a "stipulation"⁴⁹ regarding Water Resources and Biological Resources⁵⁰. (See Ex. 79.) The one critical agreement with respect to this water resources analysis is that the "Project will not result in any significant direct impacts to spring flows or to Burney Falls." Both parties filed credible evidence on the topic of water within the Burney Basin. BRG filed extensive testimony on the issue of water resources (Ex. 83), but that testimony consists principally of criticisms of Applicant's testimony. BRG's expert, Mr. Cook, does not provide any testimony on which to base a finding contrary to those suggested by Staff or Applicant. In fact, his "Conclusions" (Ex. 83, § II. D.) are only that doubt exists and that there is "significant disagreement on the part of experts in the field" and his main concern is the effect on the biological resources, discussed elsewhere in this Decision. Mr. Cook's opinion that doubt exists in this area is confirmed by the stipulation itself. Staff and Applicant agreed that "there is some inherent uncertainty in any predictive analyses of future hydrological impacts due to the nature of the analyses." (Ex. 79, Stipulation #2.) They further agree that "such uncertainty ... supports a finding that it is appropriate to require funding for mitigation measures" in the biological resources area (*Ibid.*), thereby obviating Mr. Cook's concerns. We agree with Staff and Applicant on this point. Moreover, much of Mr. Cook's testimony is effectively rebutted by Applicant in its Rebuttal Testimony on Part 2 and Part 3 Topic Areas. (See Ex. 69, Rebuttal Testimony of N. Thomas Sheahan.) The

⁴⁹ This "stipulation" did not involve any of the other parties and they are not bound by it.

⁵⁰ For a discussion of the implications of this stipulation on Biological Resources, see that section of this Decision.

conditions we adopt will adequately mitigate the impact on water resources whether we accept the Staff's analysis or we accept Applicant's analysis.

3. Project Water Supply

The project is designed to use a parallel wet/dry hybrid cooling system, rather than the wet only system proposed in the original project design. The new cooling system consists of a water-cooled system and an air-cooled system in a parallel arrangement. Steam turbine exhaust flows to both the water-cooled condenser and air-cooled condenser. The air-cooled system is sized for 100% steam condensing duty at 48°F. The air-cooled system will reduce annual water consumption and visual impacts from the cooling tower plume. The water-cooled system is sized for 100% heat rejection capacity at a 98°F dry-bulb (66°F wet bulb) which will allow design capacity electricity generation during the summer, when power demand is greatest. In order to allow BMP and TMPP to share the 350 acre-feet/year now allotted to BMP, as discussed below, TMPP indicates that BMP will be retrofitted with a hybrid cooling water system to reduce water use, or will reduce operations, or both. (Ex. 65, p. 75.)

The water needs of the project operating under various scenarios that include BMP operation, at different temperatures are shown in **Soil&Water Table 2**, below, replicated from Exhibit 65, page 75.

**Soil and Water Table 2
Water Requirements**

Dry Bulb Temperature (°F)	Relative Humidity (Percent)	Water Requirement Operating Scenario 1 (gpm)	Water Requirement Operating Scenario 2 (gpm)
98	18.6	2728	2728
85	25.4	2484	2484
73	35.3	1451	2264
48	68.3	169	169

Source: Exhibit 65, page 75.

Operating Scenario 1 – Burney Mountain Power uses only 125 AFY of water and Three Mountain Power uses the remaining 225 AFY

Operating Scenario 2 – Burney Mountain Power is not operating and all 350 AFY is used by Three Mountain Power

TMPP will obtain its water supply from the BWD with groundwater as the main source. BWD will construct and operate two new wells located approximately 4,700 feet from the site, which will be constructed similarly to existing wells. They are expected to produce about 1,500 gpm each, be approximately 300 feet deep, screened 100 feet below ground surface, with the annular space sealed from the surface to 50 feet below ground surface. (Ex. 65, p. 75.)

The revised project has been configured for a maximum consumptive use of 600 acre-feet per year of groundwater for its sole use. The adjacent BMP facility currently uses up to 350 acre-feet per year of groundwater for cooling water purposes. TMPP will be permitted to use additional groundwater up to BMP's current maximum use amount of 350 acre-feet/year only if it is not used by BMP. In other words, this 350 acre-feet/year will be shared between BMP and TMPP. The maximum possible amount of groundwater that will be permitted for the TMPP project is 950 acre-feet/year, i.e., 600 acre-feet/year dedicated to TMP and 350 acre-feet/year dedicated to BMP and/or TMP. Staff noted a discrepancy about BMP's historical use of water. Applicant describes BMP's average annual use of water as 350 acre-feet per year. However, previous reports by TMPP described BMP's average annual net use of water as 270 acre-feet a year. This

net use was calculated by subtracting the BMP discharge to the BWD for wastewater recycling and percolation from the 300 acre-feet per year pumped by the BMP. Although there is still confusion on this issue, Staff based its analysis on the more recent figures contained in the mitigation proposal, i.e., 350 acre-feet per year. (Ex. 65, p. 76.)

TMPP will not use the existing BMP well and there will not be any interconnecting pipeline between the BMP well or facility and the TMPP facility. TMPP will enter a contract with BWD to ensure that the TMPP project does not exceed a maximum groundwater use of 950 acre-feet/year, including the amount used by BMP. This will involve the use of a BWD-installed water meter at TMPP and a meter to be installed and maintained by BMP at the BMP facility. It will be necessary to meter both BMP's and TMPP's water use to ensure that the combined groundwater use by TMP and BMP does not exceed 950 acre-feet/year. Staff's analysis and conclusions are based on an assumption that the project uses not more than 950 acre-feet/year of groundwater. (Ex. 65, p. 76.) Therefore, they have proposed and we have adopted a Condition of Certification to ensure compliance with this agreement.

The project, as currently proposed, includes an optional provision for using recycled water provided by the BWD as an additional source of cooling water. This water source does not currently exist, and there is no certainty that it will be available in the future. (Ex. 65, p.76.) TMPP has indicates that they will utilize all the recycled water that the BWD can provide. (*Ibid.*) Because of biological concerns discussed in the **Biological Resources** section of this Decision, Staff has recommended, and we adopt, a condition to limit any recycled water use at the BWD current design capacity. (See Condition **SOIL&WATER-7.**)

The recycled water will meet California Department of Health Services (CDHS) standards for disinfected tertiary recycled water through additional filtration and chlorinating. The major concerns with the use of recycled water include the

generation of aerosols and contact of potable and non-potable recycled water. CDHS typically requires an air-gap separation, which provides for potable and recycled water supplies to be gravity fed into a containment vessel prior to entering the plant. In addition, drift eliminators will be used on the wet cooling towers to minimize aerosol generation. The wastewater treated by the BWD is primarily derived from the groundwater used by its customers for domestic, industrial, or other municipal purposes. BWD provides secondary treatment for this wastewater and then discharges it to percolation ponds that transmit it to the groundwater aquifer. An analysis of BWD wastewater provided by Applicant indicates that the TDS concentration in the reclaimed water was 216 mg/L. Any wastewater used by TMPP will not be available to recharge the groundwater aquifer. Therefore, the project's use of the 440,000 GPD (or 500 acre-feet per year), that BWD is currently permitted to discharge to percolation ponds and ultimately to the regional aquifer, is addressed in the water supply assessment of impacts, below. Water quality impacts as a result of the use of this recycled water by TMPP include some *improvement* in groundwater quality downgradient from the BWD percolation ponds. (Ex. 65, pp. 77-78.) This issue is further discussed under Wastewater Impacts, below.

a. Well Interference Impacts

The impact assessment of water use includes an analysis of drawdown impacts and of water supply impacts. Drawdown is the decline in groundwater levels caused by pumping. Drawdown creates a cone of depression in groundwater levels in the aquifer surrounding the well. Drawdown, which could affect both water supply wells and regional springs, can represent significant adverse impacts under certain circumstances. Water supply impacts address the effect of the project's consumption of water on springs in the Burney and Hat Creek basins whose flow may be reduced by that use. Significant well interference impacts occur when a project's pumping causes substantial and unacceptable declines in groundwater levels in existing nearby wells and in discharge to

springs. There are four adverse well interference impacts that *could* occur as a result of the project:

- Declines in groundwater levels in affected wells could increase the pumping lift, correspondingly increasing energy costs.
- The productivity of affected wells could significantly decrease if the declines in groundwater levels significantly reduced the saturated interval from which the wells draw water.
- Declines in groundwater levels in affected wells could require the lowering of well bowls to maintain efficient operation and to prevent equipment damage.
- If the declines in groundwater levels caused the water levels in affected wells to drop below the depth of the well, the wells would go dry. Less dramatic, but with the same effect, if well interference caused groundwater levels to drop below the effective pumping depth of the nearby wells, the pumps would "suck air" and the wells would be unusable. (Ex. 65, pp. 78-79.)

The depth and radial influence of the pumping drawdown are determined by the rate of pumping, the depth of the well screens and the local aquifer properties. The aquifer properties include storage, hydraulic conductivity and anisotropy, and the thickness of the aquifer. The calculation of drawdown is usually based on one of several standard equations, using an estimate or calculation of aquifer properties, a representative pumping rate, a time period, and the location of the pumping well relative to the existing, nearby wells. Given the extreme variability in hydraulic conductivity of wells in the Burney area, the likelihood of anisotropic conditions, and the lack of information on specific yield, the magnitude of drawdown that the project will cause in adjacent wells is very difficult to predict. (Ex. 65, p. 79.)

Applicant and Staff prepared independent analyses of well interference, as contained in their respective testimonies. These analyses, and the concerns of the Intervenors, while significantly disparate in several areas, need not be iterated here. As indicated during the evidentiary hearings, the parties continued to work on agreement to a set of Conditions of Certification that would satisfy all the parties. They have reached that agreement and we adopt it. A requirement

for aquifer tests in the new project wells to determine the site-specific aquifer parameters and well interference in surrounding wells is contained in Conditions **Soils&Water-8 through Soils&Water-14**. These tests and their results will determine more precisely the well interference impacts of this project. The Conditions we adopt here will also ensure mitigation of those impacts, as discussed below.

b. Wastewater Impacts

Various process and waste streams will be produced in the plant, and are shown in **Soil&Water Resources Table 11** for operating scenarios with and without recycled water available. Water entering the TMPP plant will first be treated using a multimedia filter to remove any suspended solids. A reverse (RO) osmosis system then reduces hardness, silica and TDS, and this water is used for CTG evaporative cooling and as feed to the demineralizer. The demineralizer produces low TDS water and involves two 150 gpm cation-anion trains, caustic and acid storage, demineralized water storage, and neutralization tank for regeneration wastes. A 150,000-gallon demineralized storage tank will provide approximately 21 hours of storage during the hottest months. (Ex. 65, p. 96.)

Cooling tower make-up water will be a major use of groundwater supplied by BWD. Should recycled water become available, it may also be used for cooling tower make-up. Cooling tower blowdown will be directed to a sidestream softener to reduce hardness and silica that will allow the circulating water in the cooling tower to be achieve 20-cycles of concentration. The circulating water system will have a chemical feed system to minimize corrosion and control mineral scale and biofouling. Sulfuric acid will be fed into the circulating water system to reduce alkalinity and control scaling. A scaling inhibitor consisting primarily of organic phosphates will be fed into the circulating water system to further control scale formation. Biofouling will be controlled using a 12.5 percent sodium hypochlorite bleach solution. The auxiliary cooling water system is treated in the same manner as the circulating water. (Ex. 65, p. 96.)

Soil & Water Table 11

PROCESS AND WASTE STREAMS

Stream No.	Stream Description	Summer Flow gpm @ 98°F	Summer Flow gpm @ 98°F	Average Flow gpm @ 48°F
		Well Water Only	Well Water and Recycled Water	
1	Well Water	2728	2542	169
2	RO Effluent	111	111	26
3	Mixed Bed Feed	26	25	26
4	Mixed Bed Product	22	22	22
5	Total Demin. Water Usage	22	22	22
6	CTG Demin. Wash Water Usage	1	1	1
7	CTG Evap. Cooler Water Usage	85	85	0
8	HRSG Makeup Demin. Water	21	21	21
9	Cooling Tower Makeup	2550	2550	112
10	Utility Washdown Water	1	1	1
11	Oily Water Sep. Effluent	3	3	3
12	HRSG Blowdown Streams	27	27	27
13	Cooling Tower Blowdown	532	532	23
14	Mixed Bed Reject	4	4	4
15	RO Reject	50	50	13
16	Neutralization Tank Waste Potable	54	54	17
17	Water Usage	15	15	15
18	Clean Rain Water Retention	-	-	-
19	RO Inlet	158	158	37
20	Firewater System Usage	0	0	0
21	C.T. Evaporation	2657	2657	163
22	C.T. Drift & Loss	1	1	1
23	Softner Return To CT	404	404	17
24	Evap Cooler Waste	20	20	0
25	Multimedia Filter Inlet	160	160	39
26	MM Filter Backwash	2	2	2
27	Service Water Supply	2728	2542	169
28	Purified Water Return To CT	184	184	26
29	Misc System Leaks And Drains	1	1	1
30	Continuous Blowdown	22	22	22
31	Continuous Blowdown Flash Stream	2	2	2
32	Continuous Blowdown Drain	20	20	20
33	Intermittent Blowdown	0	0	0
34	Blowdown Tank Vent	5	5	5
35	Service Water To Blowdown Tank	12	12	12
36	Misc Chem Feed	5	5	5
37	Service Water	13	13	13
38	Water Lost In SSS	0	0	0
39	BC Distillate	74	74	18
40	BC Waste To Crystallizer	14	14	3
41	SSS Outlet	127	127	6
42	RO Inlet	184	184	26
43	RO Distillate	96	96	4
44	BC Inlet	88	88	22
45	Crystallizer Return	14	14	3
46	Recycled Water	0	186	0

1. Firewater pump testing is 30 min./wk with returning to the tank. Annual usage is based on 5.5 hr/yr at 1500 gpm.
2. Summer flow based on 98°F ambient temperature and 18.6% relative humidity. Average flow based on 48°F ambient temperature and 68.4% relative humidity.

Source: Ex. 65, p. 97.

The project has been redesigned to eliminate the evaporation ponds, replacing them with a crystallizer, meaning the project no longer has a wastewater discharge and did not require a Waste Discharge permit. The wastewater treatment system now consists of a side stream softener, a reverse osmosis (RO) system, a brine concentrator (evaporator) and a crystallizer. The side stream softener allows circulating water to cycle 20 times through the cooling towers. The RO system allows the cooling tower blowdown to be further concentrated. The RO produced water is recycled back to the cooling towers and the RO reject brine stream is sent to the brine concentrator and crystallizer systems. The composition of the softener solids is shown in **Soil&Water Resources Table 12**. These solids are disposed of off-site. (Ex. 65, p. 96.)

Soil&Water Resources Table 12
SOFTENER SOLIDS COMPOSITION¹

Softener Solids	Pounds/hour
CaCO ₃	187.6
Mg(OH) ₂	91.6
SiO ₂	11.7
Phosphate scale inhibitor	9.3
Copolymer	3.2
Phosphate – HRSG scale inhibitor	2.6
Polymer – HRSG dispersant	2.6
Total Dry	308.6
Filter Cake – Solids %	50%
Total	617

¹ Ambient flow temperature is 98°F
Source: Ex. 65, p. 98.

The brine concentrator source feed is heated to near boiling in a heat exchanger and then enters the evaporator, which is a vertical tube, falling film, vapor compression unit. In the crystallizer the concentrated brine is heated and flashes in the vapor body with the water vapor being collected, condensed and recycled for reuse in the plant. As the brine becomes supersaturated with salts, these salts precipitate from the solution as crystals, which are continuously removed from the system by filtration. The crystalline solids removed by the filters will be

disposed of off-site. The chemical composition of these solids is shown in **Soil&Water Resources Table 13**. (Ex. 65, p. 98.)

Soil&Water Resources Table 13
CRYSTALLIZER SOLIDS COMPOSITION¹

Crystallizer Solids	Pounds/hour
KCl	3.5
KNO ₃	0.9
ZnCl ₂	0.2
NaCl	9.7
Na ₂ SO ₄	287.1
CaSO ₄	10.0
MgSO ₄	0.5
CuSO ₄	0.0
SrSO ₄	0.2
BaSO ₄	0.0
Na ₂ B ₄ O ₇	0.4
DEHA – HRSG scale inhibitor	0.3
RO scale inhibitor	0.7
Total Dry	313.6
Filter Cake – Solids %	75%
Total	418

¹ Ambient flow temperature is 98°F
Source: Ex. 65, p. 98.

TMPP provided analyses that indicate that the constituents contained in these solids would not be present at concentrations exceeding either the Total Threshold Limit Concentration (TTLC) or the Soluble Threshold Limit Concentration (STLC) values. These TTLC and STLC values are used to determine if a solid waste would be considered a hazardous waste under the Resource Recovery and Conservation Act (RCRA). It does not appear at this time that these solids would be classified as RCRA or California hazardous waste, but they would require disposal as a California designated waste due to their high salt content. TMPP has identified two suitable disposal sites. (See discussion in the **Waste Management** section of this Decision.) These data also indicate that the use of recycled water, should it be provided by the BWD at some point in the future, would probably not alter the classification of this solid waste (Ex. 65, pp. 98-99.)

Currently, the BWD stores sludge in a sludge lagoon when it is removed from the percolation ponds. Sludge is removed from the lagoon and disposed of in a landfill approximately every ten years. Should recycled water be used, additional solids will be removed as sludge by the BWD as the recycled water is produced. BWD will have to install new treatment equipment to provide the recycled water, which includes new clarifier, flow equalizer, filtration, coagulant and chlorination systems. (Ex. 65, p. 99.)

Since no wastewater will be discharged by the project and all constituents contained in the cooling water will be removed to appropriate disposal facilities as solids, concentration of these constituents in the cooling water will be sufficiently mitigated by the wastewater treatment and disposal systems in the redesigned project. (Ex. 65, p. 100.)

c. Cumulative Impacts

Cumulative impacts result from the incremental impact of the project when added to other past, present and reasonably foreseeable conditions. Because the project will not have any impacts on erosion and sedimentation, drainage, or impacts from the use of wastewater, the only cumulative impact addressed in this section is that resulting from impacts on water supply. Project water consumption would add to the cumulative impact of human consumption of groundwater, especially during the summer months and during drought. Staff and TMPP agreed on estimates that water consumption by human activities is currently about 20,000 acre-feet per year, increasing to about 21,000 acre-feet per year by the year 2030. (Ex. 65, p. 101.) TMPP's water consumption would initially be about 600 acre-feet per year, increasing to about 900 acre-feet per year when recycled water becomes available and increasing to a maximum of about 1,100 acre-feet per year if the wastewater treatment plant operated at maximum capacity. TMPP's water use would increase the total human water consumption by about 3 percent to 5 percent. (*Ibid.*)

Staff was particularly concerned with the TMPP's contribution to the cumulative effect of human consumption on discharges from springs during drought and during the summer months. The additional effect of the project's summer water use could lead to a substantial reduction in water supplies during drought, particularly to small springs. Given the apparent high value of regional hydraulic conductivity of the aquifer found by Staff, impacts caused by groundwater consumption during the summer probably transmit rapidly through the aquifer, increasing the likelihood of effecting springs during the summer months. Because most of the human consumption of water is used for crop irrigation and cooling, water use is disproportionately higher in the summer months, which is also when TMPP use of water would be the highest. (Ex. 65, pp. 101-102.)

The potential for cumulative impacts to Crystal Lake is of special concern, given the presence of endangered biota, according to staff biologists. Crystal Lake may be hydraulically connected to the Burney aquifer system and may be impacted by groundwater use in Burney basin. Staff found that assessing the likelihood and magnitude of significant cumulative adverse impacts of human water consumption, as well as the addition of project water consumption, on small springs is difficult. The relative lack of information on the apparent complexity of the flow paths within the aquifer, the relative lack of long-term information on spring flows, and the relative lack of information on the response of the aquifer and springs to drought conditions, led Staff to provide an *approximate* range of potential reductions in flow to springs, including the smaller springs and Crystal Lake springs, that *could* be caused by human consumption and project consumption of water, as shown in **Soil&Water Table 15**. (Ex. 65, pp. 102.)

Soil&Water Table 15
Cumulative Reduction in Outflows Caused by Human Consumption

	Human Consumption (afy)	Burney Basin Outflows With Human Consumption (afy)	Burney Basin Outflows Without Human Consumption (afy)	Reduction of Outflows Caused By Human Consumption (percent)
Average Conditions				
Annual	20,000	152,000	172,000	12%
Summer	18,000	35,000	53,000	34%
Drought Conditions				
Annual	20,000	76,000	96,000	21%
Summer	18,000	17,500	35,500	51%

Summer outflows described by Staff are based on and proportional to the flows measured at Burney Falls during the summer of 1921. Based on this analysis, staff concluded that project water use will add to substantial cumulative reduction of spring flows caused by human consumption, especially during droughts. (Ex. 65, pp. 103.) The cumulative impacts caused by these reductions are addressed the Biological Resources section of this Decision.

COOLING SYSTEM ALTERNATIVES AND SWRCB POLICY 75-58

State Water Resources Control Board (SWRCB) Policy 75-58 (Policy 75-58) represents their water quality control policy on the use and disposal of inland waters used for powerplant cooling. This policy encourages the use of alternative sources of cooling water or the use of alternative cooling technology. This policy states that the source of power plant cooling water should come from the following sources in order of priority:

1. Wastewater being discharged to the ocean.
2. Ocean water.
3. Brackish water from natural sources or irrigation returns flow.
4. Inland wastewater's of low total dissolved solids.
5. Other inland waters.

Clearly, the first two sources listed are not reasonable options for the proposed project. Nor do irrigation return flows appear to represent a reliable or sufficient water source.⁵¹ Wastewater treatment effluent is not currently available in sufficient quantities, but TMPP has committed to using recycled water to the extent it is or becomes available. Any recycled water would be derived from the BWD wastewater stream that is currently treated to a secondary level. This water would need to be treated to tertiary levels and disinfected before use as cooling tower make-up. (Ex. 65, pp. 107.)

Staff did not locate any natural sources of brackish water within the area. Staff is not aware of other wastewater streams in the project vicinity sufficient in volume for project use. Sources of inland water within the project vicinity other than the proposed groundwater are limited to surface water flows, the diversion of which would likely have greater environmental impacts than the proposed source. Policy 75-58 also requires that proposals to utilize unlined evaporation ponds for final disposal of blowdown water must include alternative methods of disposal. Policy 75-58 also states that studies associated with power plants should include an analysis of the cost and water use associated with the use of alternative cooling facilities employing dry or wet/dry modes of operation. (Ex. 65, pp. 107-108.)

Since TMPP is proposing to use a parallel wet/dry cooling system, the project complies with this portion of the policy. Given the lack of alternative water sources with the exception of recycled water, Staff concluded the project complies with the spirit of this policy. (Ex. 65, p. 108.) We agree.

⁵¹ We do note that much of the aquifer recharge in this area, from which the project water will be pumped, consists of irrigation water used in the local agriculture.

COMMISSION DISCUSSION

Based upon the above criteria, reasonable alternative sources of water for project cooling are not available or of sufficient quantities. Furthermore, the use of alternative cooling technologies would cost significantly more than the proposed use of wet cooling. Therefore, we conclude that the project complies with SWRCB Policy 75-58, whether it applies or not. The appropriate inquiry is not whether applicant *could* use an alternative cooling technology, but rather whether it *must*. The use of a dry cooling system at TMPP is technically feasible but is not necessary to reduce any direct, indirect, or cumulative environmental impacts to below a level of significance. SWRCB policy 75-58 is not a prohibition on the use of inland waters but rather direction on consideration of cooling alternatives, particularly when projects have the potential to cause a significant adverse impact. After review of alternative cooling technologies and their associated costs and benefits, and consideration of the lack of any unmitigated potentially significant adverse impacts associated with TMPP's proposed use of resources, we conclude that the water supply as proposed by the applicant is acceptable.

4. Mitigation

The applicant has submitted a draft Erosion Control and Stormwater Management Plan that discusses the revegetation of the TMPP site after construction. The draft plan identifies both temporary and permanent erosion control measures for both construction and operation of the power plant site. Temporary construction measures are intended to control the flow of stormwater runoff across disturbed areas. Temporary drainage facilities will be sized to accommodate a 10-year, 24-hour storm. To ensure sediment does not leave the site, silt fences, straw bales straw check dams, and storm drain inlet protection will be used. Dust control will be also implemented. The plan also proposes

revegetation of certain disturbed areas. Linear facilities, including pipelines and transmission lines, are included in these plans. (Ex. 65, p. 103.)

Water quality mitigation measures include curbs or dikes around all hazardous chemical storage facilities to control accidental discharges. Materials/supplies transfer pads with a volume to contain a maximum spill along with containment sumps will also be employed. In addition, TMP will comply with NPDES permit requirements for storm water discharges during operation. The permit will include wastewater discharge standards for constituents of concern and monitoring measures to insure compliance with these standards. (*Ibid.*)

As discussed above, the project will have no wastewater discharge. Through the use of a brine concentrator and a crystallizer, all water will be recovered for reuse within the plant and all constituents contained in the supply water will be concentrated and removed as solids and disposed of at a landfill. (*Ibid.*)

TMPP redesign of the project's cooling system to reduce water supply needs include:

- Parallel hybrid wet and dry cooling systems for the TMPP;
- TMPP will retrofit the BMP facility to use parallel hybrid wet and dry cooling;
- The combined use of fresh groundwater by TMPP and BMP will not exceed 950 acre-feet/year;
- TMPP will use recycled water from the BWD to the extent available;
- TMPP will include a crystallizer to distill and recycle water so that the project will not require the use of wastewater discharge ponds;
- TMPP will submit to the Commission, or otherwise make public, data indicating the actual amount of fresh water from any and all sources that TMPP and BMP use from all sources on a yearly basis;
- TMPP will make a one-time lump sum contribution in the amount of \$250,000 to the California State Department of Parks and Recreation to assist with providing educational programs at Burney Falls State Park. (Ex. 65, pp. 103-104.)

To provide accurate information to assess of actual impacts that would be caused by project groundwater use, TMPP proposed an aquifer test and

analysis. Staff also proposed such a test and analysis. After negotiations between the parties, including the Intervenors, an agreement was reached which is incorporated into this Decision and the Conditions of Certification. (Ex. 65, pp. 104, 106, Ex. 85 through Ex. 90.) This agreement provides sufficient mitigation for the impacts discussed therein.

Amended conditions establishing requirements for mitigation for well interference were included in Staff's proposed Conditions of Certification. (Exhibit 80.) The conditions we adopt, however, differ to some extent. These differences are the result of negotiations between the parties. (See Ex. 85 through Ex. 90.) Because the process for mitigating well interference involves the CPM and the physically impacted well owners and does not impose specific requirements on the project owner, we include language here as a directive to Staff. Those requirements that apply to the project owner (paying the appropriate amount of money into a mitigation fund, for example) are included in the Conditions of Certification.

In order to be eligible for mitigation, owners of physically impacted wells, as defined in **SOIL&WATER-10**, shall have one year to respond to the notification provided pursuant to **SOIL&WATER-12**. To respond, notified physically impacted well owners must select a state-licensed pump and well contractor to evaluate the existing well, test the existing specific capacity of the well ("baseline capacity"), and prepare a well evaluation report identifying the recommended mitigation and its cost. This report shall be forwarded to the CPM and the project owner. The mitigation recommended shall meet the following requirements:

- If it is possible to lower the pump by an amount equal to or greater than the maximum calculated well interference, the recommended mitigation shall be limited to pump lowering.

- If it is not possible to lower the pump unless the well is deepened, the recommended mitigation shall be limited to deepening the well and lowering the pump.
- If neither pump lowering nor well deepening is feasible, the recommended mitigation shall be well replacement.

The well evaluation report shall include:

- Contractor's license number
- Results of baseline specific capacity test
- Well depth
- Depth of bowls (pump's intake mechanism)
- Recommended mitigation
- If modification involves work other than lowering the pump, an explanation of the reason for the recommended mitigation.
- Estimate of labor, materials and other costs required to perform the recommended mitigation work.

The CPM shall complete review of the well evaluation report within thirty days of submittal, and shall work with the physically impacted well owner, the licensed pump and well contractor, and the project owner to resolve any disputes about the appropriate mitigation for the well. With approval of the well evaluation report by the CPM, the well owner shall submit the invoice from the state-licensed contractor for the cost of the well evaluation and the baseline specific capacity test to the CPM for payment. The CPM shall pay the invoice within thirty days of its receipt.

Within sixty days of the completion of the well mitigation measures approved by the CPM, and in any event no later than eight months after the CPM approves the implementation of mitigation for a well, the physically impacted well owner shall submit to the CPM an invoice from the state-licensed contractor for the

approved well mitigation. The invoice shall include the cost of any mitigation approved by the CPM as well as a post-mitigation specific capacity test. The CPM shall pay the mitigation invoice within thirty days of receipt.

If the post-mitigation capacity test indicates that the pumping capacity of the modified well is approximately at or above the baseline capacity, the mitigation for that well shall be considered complete. However, if the post-mitigation specific capacity test indicates that the pumping capacity of the modified well is below the baseline capacity, the physically impacted well owner may notify the CPM in writing that the approved mitigation was unsuccessful and that new mitigation will be required. The notification shall include the recommendation from the state-licensed pump and well contractor, consistent with the requirements identified above, for additional mitigation. The CPM shall complete review of the recommendation within thirty days. Within sixty days of the completion of the additional well mitigation measures approved by the CPM, and in any event no later than two months after the CPM approves the implementation of the additional mitigation for a well, the physically impacted well owner shall submit to the CPM an invoice from the state-licensed contractor for the approved well mitigation. The invoice can include the cost of any additional mitigation approved by the CPM and shall include a post-mitigation specific capacity test. The CPM shall pay the mitigation invoice within thirty days of receipt. These steps shall be completed until the post-mitigation capacity test indicates that the pumping capacity of the modified well is at or above the baseline capacity.

The CPM shall return all unused funds in the mitigation fund to the project owner at the completion of mitigation.

FINDINGS AND CONCLUSIONS

Based on the evidence of record, the Commission makes the following findings and conclusions:

1. Project construction will result in soil erosion, generation of dust, soil compaction, without loss of soil productivity.
2. TMPP's draft Erosion Control and Storm Water Management Plan contains "best management practices" that will mitigate potential impacts from erosion and runoff associated with project construction and operation.
3. TMPP will implement a Storm Water Pollution Prevention Plan to ensure that hazardous materials will not be transported off-site by storm water.
4. TMPP will use groundwater as the primary source of water.
5. TMPP will use a parallel wet/dry hybrid cooling system, rather than the wet only system proposed in the original project design
6. TMPP water use will range from approximately 169 gallons per minute (gpm) to 2728 gpm, plus the possible use of up to 300 gpm of recycled water.
7. The use of a dry cooling system at TMPP is technically feasible but is not necessary to reduce any direct, indirect, or cumulative environmental impacts to below a level of significance.
8. All well interference of surrounding wells will be mitigated to a level of insignificance.

The Committee concludes, therefore, that construction and operation of TMPP will not cause any unmitigated significant or cumulative adverse impacts to soil and water resources. Implementation of the Conditions of Certification, listed below, ensures that the project will conform with all applicable laws, ordinances, regulations, and standards related to soil and water resources as identified in the pertinent portions of **APPENDIX A** in this Decision.

CONDITIONS OF CERTIFICATION

SOIL&WATER-1: Prior to beginning any site mobilization, the project owner shall obtain Energy Commission staff approval for a Storm Water Pollution Prevention Plan (SWPPP) as required under the General Storm Water Construction Activity Permit for the project.

Verification: Thirty days prior to the start of any site mobilization, the project owner will submit a copy of the Storm Water Pollution Prevention Plan (SWPPP) to the Energy Commission Compliance Project Manager (CPM) for review and approval. Approval of the plan by the CPM must be received prior to the initiation of any site mobilization activities.

SOIL&WATER-2: Prior to beginning any site mobilization activities, the project owner shall obtain staff approval for a final erosion control and revegetation plan that addresses all project elements. The final plan to be submitted for staff's approval shall contain all the elements of the draft plan with changes made to address any staff comments and the final design of the project.

Verification: The erosion control and revegetation plan shall be submitted to the CPM no later than thirty days prior to start of any site mobilization. Approval of the final plan by the CPM must be received prior to the initiation of any site mobilization activities.

SOIL&WATER-3: Prior to commercial operation, the project owner, as required under the General Industrial Activity Storm Water Permit, will develop and implement a Storm Water Pollution Prevention Plan (SWPPP). Approval for the final Industrial Activities SWPPP must be obtained from Energy Commission staff prior to commercial operation of the power plant.

Verification: Thirty days prior to the start of commercial operation, the project owner will submit to the CPM a copy of the Storm Water Pollution Prevention Plan (SWPPP) prepared under requirements of the General Industrial Activity Storm Water Permit. The final plan shall contain all the elements of the draft plan with changes made to address staff comments and the final design of the project.

SOILS&WATER-4: The only fresh water the project shall use shall be fresh groundwater obtained by the project owner from wells to be installed, operated, and maintained by the Burney Water District. The location of these wells shall be as described in the Agreement between the Burney Water District and Three Mountain Power, LLC Concerning the Additions to and Modifications of the District Water System and the Provision of Service to the Three Mountain Power Generation Facility, dated April 19, 2000. The project may use water from these wells provided that the maximum pumping rate of the wells is limited to that used to calculate well interference for physically impacted wells as described in **SOIL&WATER-10.**

The Three Mountain Power project's use of fresh groundwater in each calendar year shall be limited to 600 acre feet, plus an amount equal to the difference, if any, between 350 acre feet per year and the amount actually used by Burney Mountain Power (BMP) for its own project operations during each calendar year. Prior to the project's use of any portion of BMP's 350 acre-feet/year of fresh groundwater, Burney Mountain Power shall be retrofitted to use a hybrid parallel

wet/dry cooling system that shall allow Burney Mountain Power to reduce its use of fresh groundwater.

Verification: The project owner shall submit a groundwater use summary report to the CPM, the BWD and the CDPR on an annual basis beginning within 90 days after the anniversary date of the start of operation and continuing for the life of the project. The annual summary shall be based on groundwater use recorded by BWD on BWD-installed and maintained water meter(s), and shall include calculations of the monthly range, monthly average, and total groundwater use by the project in both gallons per-minute and acre-feet. For subsequent years the annual summary shall also include the yearly range and yearly average, and the monthly range and monthly average, e.g., the range and average for all months of June, for groundwater used by the project. The same information shall be provided to the same parties for groundwater used by the BMP facility.

At least 30 days prior to the project's use of any portion of BMP's 350 acre-feet/year of fresh groundwater, the project owner shall submit to the CPM a copy of a written certificate signed by an authorized officer of Burney Mountain Power confirming that the wet/dry hybrid cooling system described above has been installed and is operational. The project may not use any of BMP's 350 acre-feet/year of fresh groundwater until the BMP wet/dry hybrid cooling system is operational.

The project owner shall include the maximum and average monthly pumping rates for the previous calendar year in the annual report required under **SOIL&WATER-14**.

SOIL&WATER-5: The project (TMPP) has reached agreements with California Unions for Reliable Energy (CURE) and with the California Department of Parks and Recreation, both of whom are Intervenor herein, regarding, *inter alia*, water resource matters. The project owners will comply with all of the following:

1. Install and operate a parallel hybrid wet and dry cooling system for the TMPP.
2. Retrofit the BMP facility to use parallel hybrid wet and dry cooling.
3. Limit the combined use of fresh groundwater by TMP and BMP to not more than 950 acre-feet/year.
4. May use recycled water from the BWD to the extent available (see Soil and Water 7 below).
5. Install and operate a crystallizer to distill and recycle water so that the project will not require the use of wastewater discharge ponds.
6. Submit to the Commission data indicating the actual amount of fresh water from any and all sources that TMP and BMP uses on at least a yearly basis.

Verification: The project will install the wet/dry parallel cooling system described in the Detailed Mitigation Plan (TMPP 2000a). Compliance will be demonstrated to the CEC CPM through a letter signed by an authorized officer of the project owner at least 60 days prior to the start of TMP operation. A summary of annual water consumed by the project will be provided in the Annual Compliance Report.

SOIL&WATER-6: The project owner will make a one-time lump-sum contribution in the amount of \$250,000 to California Department of Parks and Recreation, which will assist CDPR in providing educational programs at Burney Falls. Specifically, this payment will be used to fund a portion of State Parks' development and construction of an interpretive center to be located in Burney Falls State Park. This amount will be due and payable one day before the commencement of construction of the Three Mountain Power project. This payment will be made by delivering a check made payable to the California Department of Parks and Recreation to the following:

Nicholas Stern
Office of the Attorney General
1300 I Street
P. O. Box 944255
Sacramento, CA 94244-2550

Verification: Within one day prior to construction the project owner will notify the CPM that the contribution described above has been delivered to the California Department of Parks and Recreation as required above. Within ten days the project owner will provide to the CEC CPM a written certificate signed by an authorized officer of the project owner that verifies that the contribution has been made according to the conditions specified above.

SOIL&WATER-7: The project may use up to 500 acre-feet/year of recycled water, should it be developed and available for use at some point in the future. This amount corresponds to the current design capacity of the BWD POTW of 440,000 gallons per day (approximately 500 acre-feet/year). At this time, recycled water use by the project is only proposed as an option, and is not currently associated with the project. The Burney Water District shall be responsible for complying with all LORS and obtaining all permits required to provide recycled water to the project.

Verification: The project owner shall notify the CEC CPM at least 90 days prior to the use of recycled water by the project. Project owner shall provide the CPM with copies of any permits required for the BWD to produce and distribute recycled water, i.e., CVRWQCB and/or CDHS, etc., and with copies of any permits required by the project to accept and use recycled water at least 60 days prior to use of recycled water by the project.

The project owner shall submit a recycled water use summary report to the CEC CPM, the BWD and the CDPR in the Annual Compliance Report. The annual summary shall be based on recycled water use recorded by BWD on BWD-installed and maintained water meter(s), and shall include calculations of the monthly range, monthly average, and yearly total recycled water use by the project in both gallons-per-minute and in acre-feet. For subsequent years, the annual summary shall also include the yearly range and yearly average and the monthly range and monthly average, e.g., the range and average for all months of June, for recycled water used by the project.

SOIL& WATER-8: The project owner shall conduct (or cause Burney Water District to conduct) specific capacity tests in each of the two new project wells. The specific capacity tests for each of the two project wells shall include at least three separate pumping rates to allow assessment of the drawdown-discharge relationships in each of the two wells. In addition, the results of the specific capacity tests shall be used to design the full-scale aquifer tests.

Verification: Within one month after completion of the specific capacity tests, the project owner shall submit a report on the results of the specific capacity tests to the CPM that details how the tests were conducted and the results of the tests, including the well logs, and the raw data.

SOIL&WATER-9: The project owner shall conduct (or cause Burney Water District to conduct) aquifer tests in each of the two new project wells to determine the site-specific aquifer parameters. The project owner shall submit a work plan describing the design of the full-scale aquifer tests to the CPM for review and approval at least two months prior to the start of the aquifer tests. The work plan shall describe the methodology to be used to conduct the aquifer tests, the recommended location for the monitoring wells, and the methodology to be used to calculate the specified aquifer parameters. The project owner shall determine the locations of the monitoring wells based on the results of the specific capacity test and on the methodology selected for aquifer test analysis.

- The aquifer test for each of the two project wells shall include the measurement of water levels in the pumping well, in the monitoring wells, and in the other (non-pumping) project well. Measurement of water levels shall also be made in the Hathaway well and at a well site in Johnson Park, if the owners provide permission.
- Six monitoring wells (not including existing wells such as Hathaway's) shall be used for the aquifer tests.
- For the southerly project well, two monitoring wells will be placed based on information derived from the drilling logs of the borings for the pumping wells and the results of the specific capacity tests. The distance of these monitoring wells from the pumping well and

their orientation with respect to the pumping well will be selected to best assess aquifer parameters, including anisotropy. (Based on available aquifer data, it is anticipated that one of these monitoring wells will be oriented along the generally N-S axis of regional faulting, which is the most probable direction of regional anisotropy; the other will be located along the E-W axis. The distance of the monitoring well along the N-S axis from the pumping well may be greater than the distance of the monitoring well along the E-W axis to account for the anticipated regional anisotropy.)

- The northerly project well also will have two monitoring wells similar to those described above for the southerly project well, for assessment of aquifer parameters, including anisotropy. In addition, the northerly project well, which will be closest to the wells in Johnson Park and to large agricultural wells of concern, will have two more monitoring wells, placed in close proximity to the pumping well. The distance and orientation of the proximate monitoring wells relative to the northerly pumping well will be selected to give a high probability of observing drawdown.

Protocol:

- Water-level measurements will be made before, during, and after pumping. These water levels (and the drawdown derived from them) will be used to calculate aquifer parameters. If drawdown attributable to test pumping is observed in the pumping well, any monitoring well or in the non-pumping well, the information will be used in the calculation of aquifer parameters. If drawdown is not observed in the pumping well, any of the monitoring wells, or in the non-pumping well during either of the tests, the limit of detection of the drawdown measuring equipment (typically 0.01 feet) shall be the amount of drawdown attributed to the closest monitoring well for use in the calculation of aquifer parameters.
- The test period for each of the aquifer tests shall be forty hours.
- The aquifer tests shall be conducted at a minimum discharge rate of 1500 gpm.
- Groundwater pumped during the tests will be used and stored in the Burney Water District storage tank.
- The aquifer tests shall not be performed if rain or snowmelt has occurred during the previous seven days.

Protocol: The project owner shall calculate the following site-specific values based on the results of the aquifer tests:

- transmissivity of the aquifer;

- hydraulic conductivity;
- anisotropy, if possible; and
- storativity (storage coefficient) of the aquifer.

Verification: At least two months prior to the start of the aquifer tests, the project owner shall submit to the CPM the work plan that details (1) the methodology for conducting the proposed aquifer tests on the project wells, (2) the methodology for calculating the specified parameters and values, and (3) the methodology to be used to calculate potential well interference. The description of the methodology for calculating aquifer parameters and well interference shall contain provisions for different analysis methods depending upon the results of the aquifer testing (e.g., whether the aquifer shows anisotropy or not). The CPM shall complete review of the work plan within 30 days of submittal of the plan. With the approval of the work plan by the CPM, the project owner shall perform the aquifer tests following the methodology detailed in the work plan, including the prescribed protocol.

Within two months after completion of the aquifer tests, the project owner shall submit a report on the results of the aquifer tests to the CPM for review and approval, that details how the aquifer tests were conducted and the results of the tests, including the well logs, the raw data, the actual test procedure, and the calculation of the aquifer parameters of transmissivity, effective horizontal hydraulic conductivity, anisotropy (if possible), and storativity for each project well. The CPM shall complete review of the aquifer test report within two weeks of submittal of the report.

SOIL&WATER-10: With the approval of the aquifer tests report by the CPM, the project owner shall submit a well interference report containing a calculation of well interference impacts for existing wells that were in service at the time of the Commission decision. The well interference analysis shall include two analyses, as described below, identifying two different types of well interference impacts due to project pumping:

Physically impacted wells: This analysis shall calculate the effects of the maximum monthly amount of project water use. It shall identify all wells that could experience a drawdown of two feet or more as a result of the maximum monthly amount of project water use (“physically impacted wells”). The maximum monthly amount of project water use is defined as the maximum amount that the project shall use during any one-month period during the life of the project.

Financially impacted wells: This analysis shall calculate the monthly effects of average project water use. It shall identify all wells used for municipal, agricultural, commercial or industrial purposes that could experience an average monthly drawdown of five feet or more due to average project water use (“financially impacted wells”).

The well interference analyses described above shall use the new aquifer parameters developed from the aquifer testing of the new project wells and shall evaluate drawdown impacts based on the following assumptions and conditions:

- transient conditions
- pumping period equal to the life of the project,
- for physically impacted wells, monthly pumping based on the maximum monthly water use during the hottest part of the year and minimum water use during the remainder of the year, with the total annual project water use limited to 600 acre feet of fresh new groundwater plus 80 acre-feet per year representing the difference between Burney Mountain Power's average-annual water use and maximum-annual water use;
- for financially impacted wells, monthly pumping based on average project water use, with the total annual water use limited to 600 acre feet of fresh new groundwater plus 80 acre-feet per year representing the difference between Burney Mountain Power's average-annual water use and maximum-annual water use,
- principle of superposition, and
- maximum water consumption from BWD water treatment plant (500 acre-feet per year).

Verification: No later than one month after the submittal of aquifer test results, the project owner shall submit a well interference report and associated computer files to the CPM. The well interference report shall describe the two analyses of well interference, including a listing of all the parameters used, the calculation method, the location and distance of physically impacted wells and financially impacted wells relative to the project wells, and a copy of all computer files used in the development of the analysis. Computer files shall include any spreadsheets, model input and output files, and reference information on the model source code (i.e., source code name and version number). The CPM shall complete review of the well interference report no later than one month after the submittal of the report.

SOIL&WATER-11: After the CPM's approval of the well interference report and no later than 60 days prior to the start of commercial operation of the project, the project owner shall pay an amount equal to the Well Interference Mitigation Escrow Amount (as defined below) to the CPM or to the CPM approved organization or agency. The Well Interference Mitigation Escrow Amount shall be equal to the lesser of (i) the Actual Well Interference Mitigation Amount (as defined below), or the Maximum Well Interference Mitigation Amount (as defined below). The Well Interference Mitigation Escrow Amount will be deposited into a state-managed account set up specifically to fund the physical mitigation work required to mitigate the impacts of the project's pumping on physically impacted wells.

The Actual Well Interference Mitigation Amount shall be determined according to the following formula:

$$X = (A \times \$1,000) + (B \times C) + (D \times E),$$

where

X = the Actual Well Interference Mitigation Amount;

A = the total number of physically impacted wells identified by the well interference report described in **SOIL&WATER-10**;

B = the total number of physically impacted wells identified by the well interference report described in **SOIL&WATER-10** that are residential wells;

C = a dollar amount equal to the total cost estimated by PACE Engineering (or an alternative engineering firm similarly licensed in the State of California and acceptable to the CPM) for replacement of a typical residential well in the Burney area;

D = the total number of physically impacted wells identified by the well interference report described in **SOIL&WATER-10** that are commercial, agricultural, industrial or municipal wells; and

E = a dollar amount equal to the total cost estimated by PACE Engineering (or an alternative engineering firm similarly licensed in the State of California and acceptable to the CPM) for lowering the well bowl and replacing the engine or motor in a commercial well in the Burney area.

The Maximum Well Interference Mitigation Amount shall be determined according to the following formula:

$$Y = (a \times \$1,000) + (b \times C) + (d \times E),$$

where:

Y = the Maximum Well Interference Mitigation Amount;

a = 34 (the number of wells that are within the expected area of potential significant impact due to project pumping);

b = 24 (the number of residential wells within the expected area of potential significant impact due to project pumping);

c = a dollar amount equal to the total cost estimated by PACE Engineering (or an alternative engineering firm similarly licensed in the State of California and acceptable to the CPM) for replacement of a typical residential well in the Burney area; and

d = 10 (the number of commercial, agricultural, industrial or municipal wells within the expected area of potential significant impact due to project pumping);

e = a dollar amount equal to the total cost estimated by PACE Engineering (or an alternative engineering firm similarly licensed in the State of California and acceptable to the CPM) for lowering the well bowl and replacing the engine or motor in a commercial well in the Burney area.

The CPM shall confirm that the project owner has properly calculated the amount of the Well Interference Mitigation Escrow Amount within 15 days after receipt of such amount by the CPM.

If the amount of the Well Interference Mitigation Escrow Amount paid by the project owner to the CPM is less than the Maximum Well Interference Mitigation Amount and the CPM determines that the Well Interference Mitigation Escrow Amount is insufficient to pay for the required mitigation of the project's significant impacts to physically impacted wells, the CPM may notify the project owner in writing that additional funds shall be contributed by the project owner to the Well Interference Mitigation Escrow Amount, and the CPM shall specify the required amount; provided, however, in no event shall the CPM request (nor shall the project owner be required to contribute) any additional amounts which, when taken together with the amount of the Well Interference Mitigation Escrow Amount previously funded by the project owner, exceeds the Maximum Well Interference Mitigation Amount.

Upon completion of all mitigation work for eligible owners of physically impacted wells, any portion of the Well Interference Mitigation Escrow Amount that remains unused shall be returned by the CPM to the project owner.

Verification: After the CPM's approval of the well interference report and no later than 60 days prior to the start of commercial operation of the project, the project owner shall pay the Well Interference Mitigation Escrow Amount to the CPM for deposit into a state-managed account to fund the mitigation work required to mitigate the significant impacts of the project's pumping on physically impacted wells. Such payment shall be accompanied by supporting documentation explaining the calculation of the Well Interference Mitigation Escrow Amount according to the formula(s) set forth above and shall also be accompanied by copies of the two written estimates required to be provided by PACE Engineering (or an alternative engineering firm similarly licensed in the State of California and acceptable to the CPM).

SOIL&WATER-12: After the CPM's approval of the well interference report and concurrently with the funding of the Well Interference Mitigation Escrow Amount, the project owner shall notify all owners of physically impacted wells of the results of the well interference report, and of their eligibility for mitigation payments for physically impacted wells. Such notices (the "Eligibility Notices") shall include (i) the calculated drawdowns that would occur in the well owned by the person to whom the notice is being sent, (ii) a copy of the well interference report, (iii) the name and contact information of the person(s) at the CEC to be contacted regarding eligibility for mitigation payments from the state-managed account set up for that purpose, and (iv) a statement that the opportunity for owners of physically impacted wells to receive such mitigation payments will expire one year after the date of the Eligibility Notices. Eligibility Notices shall be sent to the address shown in the then-current Shasta County tax records for the owner of record for the property on which the physically impacted well is located. Each such notice shall be sent both via (i) a professional overnight delivery service that provides written receipts confirming delivery or otherwise confirms in writing that delivery has been attempted but not completed on at least two occasions, and (ii) U.S. mail.

The project owner shall provide copies of the Eligibility Notices (and evidence of delivery or attempted delivery) to the CPM. The CPM shall confirm that the project owner has properly provided the Eligibility Notices within 15 days after copies of such the Eligibility Notices are provided to the CPM by the project owner.

The project owner may start commercial operations 60 days after the date of the Eligibility Notices provided that the CPM, before the start of commercial operations, has confirmed that the project owner has properly provided the Eligibility Notices.

Verification: The project owner shall provide to the CPM copies of all Eligibility Notices sent to owners of physically impacted wells. The project owner shall also provide to the CPM, with respect to each owner of a physically impacted well, a written receipt from a professional overnight delivery service confirming that delivery of the Eligibility Notice was completed or written confirmation that delivery was attempted on two or more occasions but not completed.

SOIL&WATER-13: The project owner shall be responsible, on an annual basis, during the life of the project, for mitigation payments for increased energy costs (calculated according to the formula described below) for any financially impacted wells for each month in which the monthly average drawdown is equal to or greater than five feet. Annual payments of projected increased energy costs shall be made, in advance, based on projected monthly increased energy costs for those months in which the monthly average drawdown is equal to or

greater than five feet, subject to true-up within 90 days after the end of each such year based on actual increased energy costs for such months in such year.

Such increased energy costs shall be determined according to the following formula:

$$\text{Increased cost for energy} = (\text{change in lift/total system head}) \times \text{total energy consumption} \times \text{costs/unit of energy}$$

Where:

$$\text{change in lift (ft)} = \text{calculated change in water level in the well resulting from project}$$

$$\text{total system head (ft)} = \text{elevation head} + \text{discharge pressure head}$$

$$\text{elevation head (ft)} = \text{difference in elevation between wellhead discharge pressure gauge and water level in well during pumping.}$$

$$\text{discharge pressure head (ft)} = \text{pressure at wellhead discharge gauge (psi)} \times 2.31$$

- After the CPM's approval of the well interference report and no later than 60 days prior to the start of commercial operation of the project, the project owner shall notify all owners of financially impacted wells of the results of the well interference report and of their eligibility for mitigation payments for financially impacted wells. Each such notice shall be sent both via (i) a professional overnight delivery service that provides written receipts confirming delivery or otherwise confirms in writing that delivery has been attempted but not completed on at least two occasions, and (ii) U.S. mail. Such notice shall be sent to the address shown in the then-current Shasta County tax records for the owner of record for the property on which the financially impacted well is located.
- With the permission of each owner of a financially impacted well, the project owner shall provide energy meters or pressure gauges for each financially impacted well (or well field). In order for each owner of a financially impacted well to receive mitigation payments as described in this condition, the owner of the financially impacted well must provide the project owner, in a timely manner, with

documentation of such well owner's (i) energy consumption in the form of verified meter readings or other verification of energy consumption, (ii) cost per unit of energy paid, and (iii) total system head.

- The project owner shall prepare a report on financially impacted wells, which shall include the calculation of the projected increased energy costs for each financially impacted well based on projected monthly increased energy costs for those months in which the monthly average drawdown is equal to or greater than five feet (calculated according to the formula described above) for the first year of operation of the project (which, for the purposes of this condition, begins with the starting date of the project's commercial operations).
- The project owner shall provide the CPM with a copy of the report on financially impacted wells. Concurrently with delivery of the report to the CPM, the project owner shall send a copy of the report to the address shown in the then-current Shasta County tax records for the owner of record for the property on which the physically impacted well is located.
- The CPM shall review the report and inform the project owner and the financially impacted well owners, within 15 days after receipt of the report, of the approved additional mitigation payments for increased energy costs.
- The project owner shall make mitigation payments for owners of financially impacted wells in an amount equal to the projected amount of increased energy costs approved by the CPM for the first year of project operation prior to the start of the project's commercial operations, such amount to be subject to true-up within 90 days after the end of the first year of operation, as described below.
- Within 60 days after the end of the first year of project operation (and within 60 days after each subsequent year of project operation), each owner of a financially impacted well shall provide the project owner with a calculation of its actual increased energy costs for those months in which the monthly average drawdown is equal to or greater than five feet during the first year of project operation (or each subsequent year, as appropriate) calculated according to the formula described above, including supporting documentation in the form of verified meter readings or other verification of fuel consumption or energy use. The actual increased energy costs for the preceding year shall serve as the

estimate for the increased energy costs for the current year. Within 30 days after receipt of such information, the project owner shall pay to the financially impacted well owner the estimate of increased energy costs for the current year for such well owner (plus or minus an amount required to “true-up” the projected vs. actual costs for the preceding year).

Verification: Within 60 days after the CPM’s approval of the well interference report, the project owner shall provide a report to the CPM stating, as to each financially impacted well, the calculation of the projected increased energy costs for each month in which the monthly average drawdown is equal to or greater than five feet (calculated according to the formula described above) for the first year of project operation.

The CPM shall review the report and inform the project owner and the owners of financially impacted wells of the approved mitigation payments based on increased energy costs (calculated according to the formula described above) within 15 days after receipt of the report.

The project owner shall provide the CPM with evidence that it has paid the projected amount of increased energy costs for the first year of project operation, as approved by the CPM, to each owner of a financially impacted well prior to the start of the project’s commercial operations, such amount to be subject to true-up within 90 days after the end of the first year of project operation.

For each subsequent year of project operation, the project owner shall pay to each financially impacted well owner, within 30 days after receipt of required information from such financially impacted well owner, the estimate of increased energy costs for the current year based on actual increased energy costs for the preceding year (plus or minus an amount required to “true-up” the projected vs. actual costs for the preceding year).

SOIL&WATER-14: The project owner shall measure groundwater levels in two monitoring wells at the TMP wellfield on a monthly basis for the first six months following the project start up and thereafter on a quarterly basis.

Verification: Sixty days following the completion of the first six monthly groundwater level measurements, the project owner shall submit a report of the groundwater level monitoring to the CPM. Thereafter, the project owner shall include the results of the quarterly ground water level measurements in the Annual Compliance Report.

C. CULTURAL RESOURCES

Cultural resource materials such as artifacts, structures, or land modifications reflect the history of human development. Certain places that are important to Native Americans or local national/ethnic groups are also considered valuable cultural resources. This topic analyzes the structural and cultural evidence of human development in the project vicinity, where cultural resources could be disturbed by project excavation and construction. Federal and state laws require a project developer, such as TMPP, to implement mitigation measures that minimize adverse impacts to *significant* cultural resources.⁵²

SUMMARY AND DISCUSSION OF THE EVIDENCE

Cultural resources are fundamental to understanding human history and heritage. Evidence of California's early inhabitants is becoming increasingly vulnerable due to the ongoing development, industrialization, and urbanization of the state. Cultural resources may be visible on the ground or deeply buried as a result of sedimentation or subsequent uses of the land. These resources provide information about human history and the patterns of human adaptation to environmental change. (Ex. 56, p. 199.)

1. Methodology

To determine whether cultural resources exist in the project vicinity, Applicant, through Garcia and Associates, conducted research that included a records search, literature review, and field surveys in the area of potential effect (APE).

⁵² Potential impacts are considered only for those cultural resources that are deemed significant or important under criteria established by federal and state laws and regulations. If a cultural resource is determined to be eligible for or listed in the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR), then the resource is deemed significant. (National Historic Preservation Act, 16 USC 470, 36 CFR 800 et seq; CEQA Guidelines, Title 14, Cal. Code of Regs. § 15064.5; Title 14, Cal. Code of Regs., § 4850 et seq.)

This area includes the entire project site and its surroundings and all linear facility alignments. (Ex. 1, § 6.2.) This included the Three Mountain Power Facility and associated linears and the 88 miles of PG&E's 230-kV transmission lines that will be reconductored. The methods that were used to inventory cultural resources included record searches, archival research, and requests for information at the California Historical Resources Information System, California Native American Heritage Commission, recommended Native American contacts, local museums, historical societies, U.S. Forest Service, California State Library, University of California Berkeley Libraries, and U.S. Bureau of Land Management. The inventory of cultural resources for the proposed project also included systematic pedestrian field surface surveys of the project areas. A median sample of 12.5 percent was achieved, although surface visibility varied considerably. (Ex. 15, Testimony of Christopher D. Dore, Section II.B.) Three aspects of cultural resources were addressed in this research: prehistoric archaeological resources, historic archaeological resources and ethnographic resources. (Ex. 56, p. 199.)

Prehistoric Setting. Archaeological literature indicates that early residents of California typically lived near water sources that could provide them with access to a wide variety of plant and animal resources. Evidence from archaeological sites found throughout the project area indicates that native peoples may have occupied the project area, possibly as early as 5,300 years ago. The archaeological evidence seems to indicate a potential relationship between changes in the tool construction and use, hunting patterns, residential construction, and types of food resources utilized. The changes may be connected with movement of tribal groups within their ancestral lands and contact with other tribal groups through trade and social inter-action. (Ex. 56, p. 206.)

Excavation of archaeological sites began in the early 1900s and extended intermittently up through the 1980s. Based upon the archaeological data and materials recovered, as well as ethnographic records, archaeologists have

proposed several different chronologies for the developmental sequence in the project region. Researchers noted several patterns and changes in the materials used for tools and in the food resources exploited by the Native Americans prior to contact with Euro-American explorers and settlers. The types of materials that have been found and the relative dates of the cultures that produced them are more fully described in section 6.2 of Exhibit 1. (Ex. 1, § 6.2; Ex. 56, p. 206.)

Known Native American prehistoric cultural resources in the project vicinity include archaeological sites representing residential bases, resource processing and tool production, field camps, and structures. Known resources recorded in the project area range from large, complex sites indicating residential use, including burials, to sites with a great abundance and diversity of cultural materials; to widely separated and isolated artifacts. Areas where large groups settled were clearly associated with the presence of water. (Ex. 56, p. 208.)

Historic Archaeological Resources. There are numerous known historical period resources of potential interest or concern located within the project area. Some of these known resources would include: transportation facilities such as the Panorama Point Road, and the Anderson-Cottonwood Canal, the Southern Pacific Railroad, the McCloud River Railroad, remnants of the Old California-Oregon Trail and alternative routes, stagecoach routes, and other early roads; power generation and transmission facilities; timber harvest and lumber milling facilities; early rancherias and homesteads; and early commercial operations and residential communities, as represented by buildings and other structures; sites; and districts (Ex. 56, p. 210.)

Ethnographic Resources. The TMPP site and immediate project area are located within the ethnographic boundaries of the Achumawi and Atsugewi tribes. Portions of the electric transmission routes to be reconductored include ancestral lands of the Yana and the Wintu. The Achumawi and Atsugewi, the Yana, and the Wintu tribes, as well as other groups no longer present, have occupied these

lands for as long as they can recall. It is likely the pre-contact boundaries of their ancestral lands were changed and reduced in size as Euro-American settlers began to intrude and take over traditional tribal holdings. The Yana tribe was particularly affected by the arrival of settlers. By the early 20th century, few members remained. (Ex. 56, pp. 206-207.)

Records indicate that the Achumawi and Atsugewi tribes occupied the immediate project vicinity in the 1830s. Historical records indicate there was Native American resistance to Euro-American settlement in the Burney Valley and this led to a period of violent confrontation, destruction, and retaliation in 1856. Fort Crook was built in Fall River Mills in 1857 to establish a military presence in the area. In 1859 the state rounded up native residents who had survived these conflicts and moved them to the Round Valley Reservation in Mendocino County. Eventually, members of the Achumawi and the Atsugewi tribes began returning to their homelands near Burney. The Achumawi was sub-divided into nine tribelets (now called bands) and the Atsugewi were sub-divided into two tribelets or bands. Today these tribelets are now part of the Pit River Nation. (Ex. 56, p. 207.)

The Pit River Nation is comprised of eleven autonomous tribal bands, including the Madesi, the Itsatawi, the Atsugewi, the Aporige, the Atwamanini, the Ilwami, the Achomawi, the Hamawi, the Kosalektawi, the Astariwi, and the Hewisedawi. Each band has its own governing council and each band sends a representative to the Pit River Tribal Council. In addition, each band selects a cultural resource specialist to represent the interests and concerns of the band, as needed and appropriate to protect and preserve the tribal and band resources. (Ex. 56, pp. 207-208.)

Applicant's inventory of cultural resources failed to identify any cultural resources for the areas surveyed around the Three Mountain Power Project site or the site's linear infrastructure tie-ins. The inventory did identify a total of 58 cultural

resources and an additional 36 isolated artifacts within the surveyed areas of the transmission line reconductoring corridor. Of these, 47 resources are archaeological sites from the historic period, two are archaeological sites with prehistoric and historic components, and six are extant historic period features. Significant resources are those that have been determined eligible for listing on the National Register of Historic Places or the California Register of Historical Resources. None of these resources have had their eligibility for listing on these registers evaluated. (Ex. 15, Testimony of Christopher D. Dore, Section II.B.)

Applicant and Staff have initiated contact with Indian Tribes who may have interests in the project area.⁵³ Letters to Tribal Chairmen and tribal cultural leaders were sent to the Pit River Tribe, the Redding Rancheria, Roaring Creek Rancheria and the Winnemen Band of Wintu/Toyon. (Ex. 15, Testimony of Danielle Tinman, Section II.A; Ex. 56, pp. 212-213.) Members of the Pit River Nation indicated to Staff that many areas along the reconductoring route were generally identified as being particularly sensitive. During workshops, TMPP indicated that no Native American monitors were included in the cultural resource survey crew for the AFC. In discussions with Staff, Pit River representatives indicated that they feel additional surveys and testing will be required prior to the start of reconductoring and that Native American monitor must be present. (Ex. 56, p. 212.) Staff proposed, and we adopt, conditions of certification intended to provide for such Native American monitoring. (See conditions **CUL-3 through CUL-6**.) Applicant agrees with and accepts these conditions. (Ex. 15, Testimony of Christopher D. Dore, Section III; Ex. 15, Testimony of Danielle Tinman, Section III.)

⁵³ We also take judicial notice of the extensive contacts by the Public Adviser's Office as reflected in the Docket.

2. Potential Impacts

Since site preparation and project development and construction usually entail surface and sub-surface disturbance of the ground, the proposed TMPP has the potential to adversely affect both known and previously unknown cultural resources. For many other types of resources, the effects of ground disturbance during construction are often deemed "temporary" since they generally occur only during construction-related activities. (Ex. 56, pp. 216-217.)

For cultural resources, the potential for temporary effects is very small. Once cultural resource materials have been encountered/disturbed during project site preparation or during project construction, the effect is permanent. Some examples of "temporary effect" on cultural resources would be blockage of access to a known site or resource for a period of time, short-term intrusion of modern-day construction noises and/or dust in a historic district, or temporary scaffolding surrounding a historic building. Typically, once these activities are completed, the temporary effects would be alleviated. (Ex. 56, p. 217.)

The potential for permanent effects to occur to cultural resources is associated with direct damage to, or destruction of, known or previously unknown resources during construction activities. Permanent effects to cultural resources may occur if sensitive resource areas are used for parking or storage because any resources present could be compressed, dislocated, or damaged. Permanent effects may also occur with the development and use of new access roads to a previously inaccessible area, thereby providing an opportunity for project personnel or members of the public to vandalize a site. Ongoing maintenance of pipelines and other linear facilities also have the potential to have permanent effects on cultural resources. (Ex. 56, p. 217.)

The presence of known sites of historical and prehistoric interest near the project site, linear routes and reconductoring corridor and the evidence of human

habitation over a period of thousands of years, in or near the APE, indicate that construction of the proposed project has the potential to encounter previously unknown cultural resources. (Ex. 56, p. 218.)

The majority of potential impacts to cultural resources is associated with the construction phase of the project. Given the presence of known cultural resources throughout the project area, the sensitivity of the project area is moderate to high. The number of sites, both known and unknown, that cannot be avoided is uncertain. The potential significance of an unknown resource cannot be determined until it has been discovered and evaluated by qualified professionals. (Ex. 56, pp. 218-219.)

Cumulative Impacts. Proposed developments such as the TMPP site and its associated linear facilities, in conjunction with other development projects, will increase the amount of land exposed to public access and potential removal or damage to cultural resources. The combined effects of such development can accelerate the potential for continued disturbance of cultural resource sites and the loss of valuable scientific information. The level of cumulative impact will grow as increasing development opens more undisturbed areas and eventually exposes highly sensitive cultural resource sites. (Ex. 56, pp. 220-221.) The implementation of appropriate mitigation measures is essential to the protection of valuable cultural resources and the recovery of information on earlier climate patterns and human adaptations to these environmental conditions. We encourage and insist on continuing consultation and cooperation between the project owner, the Native American representatives, and local citizens to facilitate the protection and mitigation of sensitive and/or significant cultural resources sites. (Ex. 56, p. 221.)

The incremental effect of this project is likely to contribute to a significant cumulative impact in, or adjacent to, the PG&E reconductoring corridors. The process of establishing the boundaries of known sites within the corridors and

assessing their potential significance has not been completed. The process of determining the presence of significant cultural resources will continue into the construction phase of this project. The Conditions we adopt requiring monitoring and mitigation will mitigate impacts to both undetermined and identified sites to less than significant. (*Ibid.*)

3. Mitigation

The preferred mitigation for impacts to cultural resources is avoidance of the resource. If previously unknown cultural resources are encountered during site clearance and preparation, or during project construction, and they cannot be avoided, contingency measures must be in place to protect them. (Ex. 56, p. 222.)

Critical to the success of any mitigation effort is the selection of a qualified professional cultural resources specialist. This designated specialist must have the authority to halt or redirect work if cultural resources are encountered. Review and approval of the qualifications of the professional archaeologist by Commission staff is required. In addition, as recommended by Staff and agreed to by Applicant, a qualified Native American Observer will assist the designated cultural resource specialist in monitoring pre-project site clearing and project construction activities and advise on the avoidance of sacred sites. (Ex. 56, p. 223.) The adopted mitigation measures will reduce the potential for adverse project impacts on the project region's cultural resources to a less than significant level. (*Ibid.*)

The proposed mitigation measures would apply to any potential for impacts to sensitive cultural resources in all areas affected by the project. Mitigation measures are derived from good professional practice. They are based on the U.S. Secretary of Interior's guidelines and have been developed using Staff's experience and recommendations. The conditions have been applied to

previous projects before the Commission and have proven successful in protecting sensitive cultural resources from construction-related impacts, while allowing the timely completion of the projects. (Ex. 56, p. 229.)

FINDINGS AND CONCLUSIONS

Based on the uncontroverted evidence of record, the Commission makes the following Findings:

1. There are several known cultural resources within the critical Area of Potential Effect (APE).
2. No prehistoric cultural resources have been previously recorded or encountered during surveys of the TMPP site and related linear facility routes. For the PG&E reconductoring projects, however, there are nearly sixty known, recorded cultural resource sites located within the corridor. Since numerous prehistoric sites and isolates have been recorded within the project area, there is a strong possibility that project construction could encounter potentially significant cultural resources.
3. There is potential for impacts to unknown cultural resources that may not be discovered until subsurface soils are exposed during excavation and construction. Monitoring and mitigation by a qualified cultural resource specialist and Native American Monitor are essential to reduce the potential for project impacts to cultural resources to a less than significant level.
4. The mitigation measures contained in the Conditions of Certification below will ensure that direct, indirect, or cumulative adverse impacts to cultural resources do not occur as a result of project activities.
5. Construction of the TMPP can be accomplished in a manner that can avoid potential adverse changes to the significance of the known prehistoric and historic resources. The potential for adverse changes to as yet undiscovered additional cultural resources will remain unknown until, and unless, such resources are encountered.

The Commission therefore concludes that with the implementation of the Conditions of Certification by qualified professionals and knowledgeable Native American monitors, in a timely and proper manner, the project will be in compliance with the applicable laws, ordinances, regulations, and standards relating to cultural resources.

CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall provide the California Energy Commission Compliance Project Manager (CPM) with the name and statement of qualifications for its designated cultural resource specialist who will be responsible for implementation of all cultural resources Conditions of Certification.

Protocol: The statement of qualifications for the designated cultural resource specialist shall include all information needed to demonstrate that the specialist meets the minimum qualifications set forth below, including the following:

- a. a graduate degree in archaeology and cultural resource management;
- b. at least three years of archaeological resource mitigation and field experience in California; and
- c. at least one year's experience in each of the following areas:
 - leading archaeological resource field surveys;
 - leading site and artifact mapping, recording, and recovery operations;
 - marshalling and use of equipment necessary for cultural resource recovery and testing;
 - preparing recovered materials for analysis and identification;
 - determining the need for appropriate sampling and/or testing in the field and in the lab;
 - directing the analyses of mapped and recovered artifacts;
 - completing the identification and inventory of recovered cultural resource materials; and
 - preparing appropriate reports to be filed with the receiving curation repository, the SHPO, all appropriate regional archaeological information center(s).

The statement of qualifications for the designated cultural resource specialist shall include:

- 1) a list of specific projects the specialist has previously worked on;

- 2) the role and responsibilities of the specialist for each project listed;
and
- 3) The names and phone numbers of contact persons familiar with the specialist's work on these referenced projects.

Verification: At least ninety days prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall submit the name and statement of qualifications of its designated cultural resource specialist to the CPM for review and written approval.

At least ten days, but no more than thirty days, prior to the start of any project-related earth disturbing action, the project owner shall confirm in writing to the CPM that the approved designated cultural resource specialist will be available at the start of project-related site preparation and earth moving activities, and is prepared to implement the cultural resource Conditions of Certification.

At least ten days prior to the termination or release of a designated cultural resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated cultural resource specialist.

CUL-2 Prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall provide the designated cultural resource specialist and the CPM with maps and drawings issued for the construction site plan and site layout, the final alignment of all linear facilities, and the location of all auxiliary work areas. The routes for the linear facilities shall be provided on 7.5-minute quad maps, showing:

- a. post mile markers (including "tic marks" for tenths of a mile);
- b. final center lines and right-of-way boundaries; and
- c. the location of all the various areas where surface disturbance may be associated with project-related access roads, storage yards, laydown sites, pull sites, pump or pressure stations, switchyards, electrical tower or pole footings, and any other project components.

The designated cultural resource specialist may request, and the project owner shall provide, enlargements of portions of the 7.5 minute maps presented as a sequence of strip maps (or other acceptable format approved by the designated specialist) for the linear facility routes. The strip maps would include post mile and tenth of a mile markers and show the detailed locations of proposed access

roads, storage or laydown sites, tower or pole footings, and any other areas of disturbance associated with the construction and maintenance of project-related linear facilities. The project owner shall also provide copies of any such enlargements to the CPM and the Native American monitor(s) at the same time as they are provided to the specialist. Any changes thereafter should be mapped and provided to the specialists in the daily briefings referenced in **CUL-9** and to the CPM in the Monthly Compliance Report.

Verification: At least seventy-five (75) days prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall provide the designated cultural resource specialist and the CPM with final drawings and site layouts for all project facilities and maps at appropriate scale(s) for all areas potentially affected by project construction. If the designated cultural resource specialist requests enlargements or strip maps for linear facility routes, the project owner shall also provide a set of these maps to the CPM and the Native American monitor(s) at the same time that they are provided to the specialist.

CUL-3 Prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner and the designated cultural resources specialist shall consult with Native American tribal representatives to identify affected tribes or bands and to develop an agreement(s) for qualified Native American (Pit River and Wintu tribes, as appropriate) monitors. The monitors must be present during the pre-construction and construction phases of the project and throughout the reconductoring project.

Verification: At least sixty days prior to start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall provide the CPM with a copy of all finalized agreements for Native American (Pit River and Wintu tribes, as appropriate) monitors. If efforts to obtain the services of qualified tribal monitors prove unsuccessful, the project owner shall immediately inform the CPM and who will initiate a resolution process.

CUL-4 All Conditions of Certification adopted by the Energy Commission relative to the reconductoring, shall be extended to Pacific Gas and Electric

Company (PG&E) (or any successor or assignees) and to its contractor for the reconductoring project. Prior to vegetation clearance, surface disturbance, site grading, or site preparation, the project owner shall enter into a legally binding agreement with PG&E to require PG&E, and any successors or assignees, and its contractors to participate in the TMPP employee awareness training program for cultural resources and to require the use of qualified Native American (Pit River and Wintu tribes, as appropriate) monitors in the pre-project surveys and in all reconductoring activities on those routes which are to be reconductored to carry the power produced by the TMPP.

Verification: At least sixty days prior to vegetation clearance, surface disturbance, site grading, or site preparation, the project owner will provide the CPM with a copy of its finalized agreement with PG&E and its contractors that meets the requirements of this condition. Any proposal by either party to terminate the agreement will be submitted to the CPM for review and consideration of approval, in consultation with appropriate federal, state, and local agencies.

CUL-5 Prior to the start of earth disturbing activities related to the transmission line reconductoring, the designated cultural resources specialist and a qualified Native American (Pit River and Wintu tribes, as appropriate) monitor shall conduct reconnaissance surveys and any necessary presence/absence testing, data recovery and significance evaluation of the final pull sites and any other areas expected to be affected by the reconductoring project. Surveys of the reconductoring routes shall use the centerlines and rights-of-way delineated by the survey stakes placed for final project engineering and design.

Protocol: During the surveys, potentially sensitive cultural resource areas that must be protected during construction and operation shall be mapped and listed for specific monitoring and/or mitigation measures to be described in the Cultural Resources Monitoring and Mitigation Plan to be prepared per Condition **CUL-6**, below.

Verification: At least sixty days prior to the start of earth disturbing activities related to the reconductoring project, the designated cultural resources specialist and Native American monitor(s) shall conduct reconnaissance surveys of the final pull sites and all other areas expected to be affected by the reconductoring project. Within ten days after completion of the surveys, the project owner shall submit a letter summarizing the dates, methodology and preliminary findings of the survey to the CPM for review and approval.

CUL-6 Prior to the start of project vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the

movement or parking of heavy equipment or other vehicles onto or over the project surface, the designated cultural resources specialist shall prepare, and the project owner shall submit to the CPM for review and written approval, a Cultural Resources Monitoring and Mitigation Plan (CRMMP), identifying general and specific measures to minimize potential impacts to sensitive cultural resources.

Protocol: The Cultural Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:

- a. A proposed research design that includes a discussion of questions that may be answered by the mapping, data and artifact recovery conducted during monitoring and mitigation activities, and by the analysis of recovered data and materials. It shall provide details of the data needed to address the research issues and the methods proposed to obtain such data.
- b. A discussion of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the pre-construction, construction, and post-construction analysis phases of the project.
- c. Identification of the person(s) expected to perform each of the tasks; a description of each team member's qualifications and their responsibilities; and the reporting relationships between project construction management and the mitigation and monitoring team.
- d. A discussion of the inclusion of Native American (Pit River and Wintu, as appropriate) observers or monitors, the procedures to be used to select them, the areas or post-mile sections where they will be needed, and their role and responsibilities.
- e. A discussion of measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects.
- f. A discussion of where monitoring of project construction activities is deemed necessary by the designated cultural resource specialist. The specialist will determine the size or extent of the areas where monitoring is to occur and will establish the percentage of the time that the monitor(s) will be present.

- g. A discussion of the requirement that all cultural resources encountered will be recorded and mapped (may include photos) and all significant or diagnostic resources will be collected for analysis and eventual curation into a retrievable storage collection in a public repository or museum that meets the standards and requirements for the curation of cultural resources set forth at Title 36 of the Federal Code of Regulations, Part 79.
- h. A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during construction.
- i. Identification of the public institution that has agreed to receive any data and cultural resources recovered during project-related monitoring and mitigation work. Discussion of any requirements, specifications, or funding needed for the materials to be delivered for curation and how they will be met. Also include the name and phone number of the contact person at the institution.

Verification: At least sixty days prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall provide the Cultural Resources Monitoring and Mitigation Plan (CRMMP), prepared by the designated cultural resource specialist, to the CPM for review and written approval.

CUL-7 Prior to the start of project vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the designated cultural resources specialist shall prepare an employee training program. The project owner shall submit the cultural resources training program to the CPM for review and written approval.

Protocol: The training program shall discuss the potential to encounter cultural resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

Protocol: The training program shall also include the set of resource reporting procedures and work curtailment procedures that workers are to

follow if previously unknown cultural resources are encountered during project activities. The training program shall be presented by the designated cultural resource specialist or qualified individual(s) approved by the CPM and may be combined with other training programs prepared for biological resources, paleontologic resources, hazardous materials, or any other areas of interest or concern.

Verification: At least sixty days prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall submit to the CPM for review and written approval, the proposed employee training program, the set of reporting procedures, and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during construction. The project owner shall provide the name and resume of the individual(s) performing the training.

CUL-8 Prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, and throughout the project construction period as needed for all new employees, the project owner shall ensure that the designated cultural resource trainer(s) provide(s) the CPM-approved cultural resources training to all project managers, construction supervisors, and workers. The project owner shall ensure that the designated trainer provides the workers with the CPM-approved set of procedures for reporting any sensitive resources that may be discovered during project-related ground disturbance and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during construction.

Verification: Within seven days after the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall provide the CPM with documentation that the designated cultural resources trainer(s) has/have provided to all project managers, construction supervisors, and workers hired before the start of construction the CPM-approved cultural resources training and the set of reporting and work curtailment procedures.

In each Monthly Compliance Report after the start of pre-construction activities, the project owner shall provide the CPM with documentation that the designated

cultural resource trainer(s) has/have provided to all project managers hired in the month to which the report applies, the CPM-approved cultural resources training and the set of resource reporting and work curtailment procedures.

CUL-9 The designated cultural resource specialist or the specialist's delegated monitor(s), shall have the authority to halt or redirect construction if previously unknown cultural resource sites or materials are encountered during project-related grading, augering, excavation and/or trenching.

Protocol: If such resources are found and the specialist determines that they are not significant, the specialist may allow construction to resume. The project owner shall notify the CPM of the find as set forth in the Verification.

Protocol: If such resources are found and the specialist determines that they are or may be significant, the halting or redirection of construction shall remain in effect until:

- the designated cultural resources specialist has notified the CPM of the find and the work stoppage;
- the specialist, tribal representatives, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed; and
- Any necessary data recovery and mitigation has been completed.

The designated cultural resources specialist, the tribal representatives, the project owner, and the CPM shall confer within five working days of the notification of the CPM to determine what, if any, data recovery or other mitigation is needed.

If data recovery or other mitigation measures are required, the designated cultural resource specialist, tribal monitors, and team members shall monitor construction activities and implement data recovery and mitigation measures, as needed. All required data recovery and mitigation shall be completed expeditiously unless all parties agree to additional time.

Verification: Thirty days prior to the start of construction, the project owner shall provide the CPM with a letter confirming that the designated cultural resources specialist and delegated monitor(s) have the authority to halt construction activities in the vicinity of a cultural resource find. For any cultural resource encountered that the specialist determines is or may be significant, the project owner shall notify the CPM within 24 hours unless there is an intervening weekend. If there is an intervening weekend, the project owner shall notify the CPM on the Monday following the weekend.

For any cultural resource encountered that the specialist determines is not significant, the project owner shall notify the CPM within 72 hours after the find and provide written documentation of the evaluation.

CUL-10 Prior to the start of vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, and each week throughout project construction (the period involving any ground disturbing activities, including landscaping), the project owner shall provide the designated cultural resource specialist and the CPM with a current schedule of anticipated project activity in the following month and a map indicating the area(s) where the construction activities will occur. The designated cultural resources specialist shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s).

Verification: At least thirty days prior to the start of vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, and in each Monthly Compliance Report thereafter, the project owner shall provide the designated cultural resource specialist and the CPM with a week-by-week schedule of the upcoming earth disturbing activities, construction, and mitigation activities, including those to be implemented by other specialists, on or off the APE. The project owner shall also provide maps, showing where construction activity is to take place. These advance schedules are to be provided to the CPM with the Monthly Compliance Report. The project owner shall notify the CPM when all ground disturbing activities, including landscaping, are completed.

CUL-11 Throughout the pre-reconductoring surveys and the monitoring and mitigation phases of the project, the designated cultural resources specialist and delegated monitor(s) shall keep a daily log describing the area and nature of the work, any resource finds, and the progress or status of the resource monitoring, mitigation, preparation, identification, and analytical work being conducted for the project. The daily logs shall indicate by tenths of a post mile, where and when monitoring has taken place, where monitoring has been deemed unnecessary, and where cultural resources were found.

Protocol: The designated specialist shall prepare a weekly summary of the daily logs on the progress or status of cultural resource-related activities.

The designated resource specialist and delegated monitor(s) may informally discuss the cultural resource monitoring and mitigation activities with Commission technical staff.

Verification: Throughout the project-related pre-construction and construction periods, the project owner shall ensure that the daily log(s) and the weekly summary reports prepared by the designated cultural resource specialist and delegated monitor(s) are available for periodic audit by the CPM. Upon request by the CPM, the project owner shall provide specified weekly summary reports to the CPM.

CUL-12 The designated cultural resource specialist or delegated monitor(s) shall be present at times the specialist deems appropriate to monitor pre-construction and construction-related grading, excavation, trenching, augering, or other disturbance of existing surface in the vicinity of previously recorded archaeological sites and in areas where cultural resources have been identified.

If the designated cultural resource specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner of the changes. The designated cultural resource specialist shall use milepost markers and boundary stakes placed by the project owner to identify areas where monitoring is being reduced or is no longer deemed necessary.

Verification: During any earth disturbing activity and throughout the project construction period the project owner shall include in the Monthly Compliance Reports to the CPM copies of the weekly summary reports prepared by the designated cultural resource specialist regarding project-related cultural resource monitoring.

CUL-13 The project owner shall ensure that the designated cultural resource specialist performs the recovery, preparation for analysis, analysis, preparation for curation, and delivery for curation of all cultural resource materials encountered and collected during pre-construction surveys and during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files, copies of signed contracts or agreements with the individuals, museum(s), institutions, which will ensure the necessary recovery, preparation for analysis, and analysis of cultural resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for the life of the project and the files shall be kept available for periodic audit by the CPM. Information as

to the specific location of sensitive cultural resource site shall be kept confidential and accessible only to qualified cultural resource specialists.

CUL-14 Following completion of data recovery and site mitigation work the project owner shall ensure that the designated cultural resources specialist prepares a proposed scope of work for the Cultural Resources Report. The project owner shall submit the proposed scope of work to the CPM for review and written approval.

Protocol: The proposed scope of work shall include (but not be limited to):

- a. A discussion of any analysis to be conducted on recovered cultural resource materials;
- b. discussion of possible results and findings;
- c. proposed research questions which may be answered or raised by analysis of the data recovered from the project; and
- d. An estimate of the time needed to complete the analysis of recovered cultural resource materials and prepare the Cultural Resources Report.

Verification: The project owner shall ensure that the designated cultural resources specialist prepares the proposed scope of work within ninety (90) days following completion of the data recovery and site mitigation work. Within seven (7) days after completion of the proposed scope of work, the project owner shall submit it to the CPM for review and written approval.

CUL-15 The project owner shall ensure that the designated cultural resources specialist prepares a Cultural Resources Report. The project owner shall submit the report to the CPM for review and written approval.

Protocol: The Cultural Resources Report shall include (but not be limited to) the following:

- a. For all projects:
 - A description of pre-project literature search, surveys, and any testing activities; maps showing areas surveyed or tested; a description of any monitoring activities; maps of any areas monitored; and conclusions and recommendations.
- b. For projects in which cultural resources were encountered, include the items specified under "a" and also provide:

- Site and isolate records and maps; a description of testing for, and determinations of, significance and potential eligibility; and a discussion of the research questions answered or raised by the data from the project.
- c. For projects regarding which cultural resources were recovered, include the items specified under "a" and "b" and also provide:
- A description of the methods employed in the field and laboratory; a description (including drawings and/or photos) of recovered cultural materials; results and findings of any special analyses conducted on recovered cultural resource materials; an inventory list of recovered cultural resource materials; an interpretation of the site(s) with regard to the research design; and the name and location of the public repository receiving the recovered cultural resources for curation.

Verification: The project owner shall ensure that the designated cultural resources specialists completes the Cultural Resources Report within ninety (90) days following completion of the analysis of the recovered cultural materials. Within seven (7) days after completion of the report, the project owner shall submit the Cultural Resources Report to the CPM for review and written approval.

CUL-16 The project owner shall submit an original, an original-quality copy, and a computer disc copy of the CPM-approved Cultural Resource Report to the public repository to receive the recovered data and materials for curation (or other format to meet the repository's requirements), with copies to the State Historic Preservation Officer (SHPO), the Pit River tribe and affected tribal bands, the Wintu tribe, and, the appropriate regional archaeological information center(s). If the report is submitted to any of these entities on a computer disc, the disc files must meet SHPO requirements for format and content.

Protocol: The copies of the Cultural Resource Report to be sent to the curating repository, the SHPO and the regional information center(s), and the affected Native American tribes (Pit River and Wintu, as appropriate), shall include the following (based on the applicable scenario (a, b, or c) set forth in the previous condition):

- a. originals or original-quality copies of all text;
- b. originals of any topographic maps showing site and resource locations;
- c. originals or original-quality copies of drawings of significant or diagnostic cultural resource materials found during pre-construction

- surveys or during project-related monitoring, data recovery, or mitigation; and
- d. Photographs of the site(s) and the various cultural resource materials recovered during project monitoring and mitigation and subjected to post-recovery analysis and evaluation. The project owner shall provide the curating repository with a set of negatives for all of the photographs.

Verification: Within thirty days after receiving approval of the Cultural Resources Report, the project owner shall provide to the CPM documentation that the report has been sent to the public repository receiving the recovered data and materials for curation, the SHPO, the concerned tribe(s), and the appropriate archaeological information center(s), and the affected Native American tribes.

For the life of the project the project owner shall maintain in its compliance files copies of all documentation related to the filing of the CPM-approved Cultural Resources Report with the public repository receiving the recovered data and materials for curation, the SHPO, the concerned tribe(s), and the appropriate archaeological information center(s).

CUL-17 Following the filing of the CPM-approved Cultural Resource Report with the appropriate entities, the project owner shall ensure that all cultural resource materials, maps and data collected during data recovery and mitigation for the project are delivered to a public repository that meets the US Secretary of Interior requirements for the curation of cultural resources. The project owner shall pay any fees for curation required by the repository.

Verification: The project owner shall ensure that all recovered cultural resource materials are delivered for curation within thirty days after providing the CPM-approved Cultural Resource Report to the public repository receiving the recovered data and materials, to the SHPO, to the concerned tribe(s), and to the appropriate archaeological information center(s).

For the life of the project the project owner shall maintain in its project history or compliance files, copies of signed contracts or agreements with the public repository to which the project owner has delivered for curation all cultural resource materials collected during data recovery and mitigation for the project.

C. GEOLOGY AND PALEONTOLOGY

This section addresses the project's potential impacts on geological hazards, geological and paleontological resources, and surface water hydrology. Paleontological resources include the fossilized remains or trace evidence of prehistoric plants or animals, which are preserved in soil or rock. These fossils are scientifically important because they help document the evolution of particular groups of organisms and the environment in which they lived.

The purpose of the geological and paleontological analysis is to verify that:

- applicable laws, ordinances, regulations, and standards (LORS) have been identified, and
- the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The proposed project is made up of two major elements and support facilities as follows:

- a 500 MW power plant to occupy approximately 10.2 acres located in Burney Valley in Shasta County;
- a 60-mile long 230 kilovolt (kV) electric transmission line reconductoring project; and
- natural gas and water supply lines. (Ex. 17, p.1; Ex. 56, pp. 292; 294.)

Burney Valley is located in the southern portion of the Cascade Range/Modoc Plateau geomorphic province that covers most of the northeast corner of California. (Ex. 1, § 6.17.1, Figure 6.17-1; Ex. 56, p. 292.) The Cascade Range (Modoc Plateau):

- extends from southern British Columbia's Mt. Garibaldi to Lassen Peak, and includes 12 major and many minor cones built on or near the western edge of the Columbia Plateau;
- is characterized in the western portion by explosive eruptive volcanics grading eastward into thick, mainly Tertiary lava flows characteristic of the larger Columbia Plateau;⁵⁴
- includes north-south trending fault blocks reminiscent of the Basin and Range Province. (Ex. 1, § 6.17.1.)

The site is located on Pleistocene age basalt, which is partially covered by a thin veneer of alluvial soil.⁵⁵ (Ex. 56, pp. 292, 294.) Staff observed no fossils during a site visit on August 18, 1999, and no paleontological resources are known to exist at the power plant footprint. (Ex. 56, p. 294.) Although several of the proposed facility's formations have a high paleontological significance, Staff believes there is a low potential for any of these resources being encountered.⁵⁶ (*Ibid.*) Staff has proposed conditions of certification that will enable Applicant to mitigate impacts upon paleontological resources to a less than significant level should they be encountered during construction, operation, and closure of the project. (See Conditions **PAL-1–PAL-7.**)

⁵⁴ Two of the Cascade Range volcanoes are located in California: (Ex. 1, § 6.17.1.) Mount Shasta, the second highest peak in the chain, and Mount Lassen, the second most recently active volcano in the continental 48 states, after Mount Saint Helens. (*Ibid.*) Lassen Peak, located approximately 29 miles south of the proposed project, is a very large plug dome that erupted sporadically from 1914 to 1921. (Exs. 1, § 6.17.1; Ex. 17, p. 2.) Both Lassen Peak and Mt. Shasta are monitored for volcanic and seismic activity by the U.S. Geological Survey (USGS) and the State of California. (Ex. 17, p. 2.)

⁵⁵ Basalt is formed by the cooling of lava at or near the surface of the earth. (Ex. 56, p. 294.) The origin of the basalt is clearly not conducive to the preservation of plants or animals, and the alluvium is considered too young to contain fossils. (*Ibid.*) Burney Valley is surrounded by volcanic cinder cones and mountains. (Ex. 1, p. 6.17-1.)

⁵⁶ Staff did find a set up and cable pull area where shell fragments are exposed, but no other macro fossils are known to exist at the cable pull areas along the reconductoring corridor. (Ex. 56, p. 294.)

No geological resources have been identified at the power plant location, the natural gas supply line route, or the water supply line route.⁵⁷ (Ex. 56, p. 294.) The reconductoring corridor crosses an area designated by the State to be MRZ-2b (known marginal mineral reserves) in two locations. (*Ibid.*) Mineralogical resources along the reconductoring corridor include sand, gravel and diatomite. The areas where the reconductoring corridor crosses mineralogical resource zones are not considered to have a significant impact since the transmission line towers are already in place, as are the transmission line set and pull locations. (*Ibid.*)

The power plant footprint is not located in a 100-year flood zone. (Ex. 56, p. 294.) No surface water bodies are located on or adjacent to the power plant footprint.⁵⁸ (Ex. 56, p. 292.) The existing grade of the power plant footprint is shallow (less than 5%). (Ex. 56, p. 292.) Minimum grade for the power plant area will be 1 percent, all drainage will be directed away from buildings within the footprint, and spill containment features will have a minimum of one-foot-freeboard. (Ex. 56, p. 294.) The 100-year 24-hour-storm-event precipitation amount is 5 inches. (*Id.* at p. 292.) Runoff during a 100-year 24-hour-storm-event should not overwhelm the capacity of the proposed surface-water drainage system. (*Ibid.*)

Site elevation for the proposed facility is approximately 3,140 feet above mean sea level (MSL). (Ex. 1, § 6.17.1.) Elevations in the project area vary from

⁵⁷ Numerous mineral commodities have been mined in Shasta County since gold was discovered there in the 1840s. Precious metals such as gold and silver, and base metals including copper, lead, and zinc, were extensively mined in the county in the past. Currently, industrial minerals comprise the majority of Shasta County's mineral production. (Ex. 17, pp. 2-3.)

⁵⁸ A small detention-basin is located to the northeast of the existing biomass power plant at the proposed power plant location. (Ex. 56, p. 292.)

approximately 3,812 feet above MSL at Brush Mountain, just northeast⁵⁹, to 4,519 feet above MSL at Lookout Mountain, just northwest of the proposed project site. Burney Mountain, approximately 7 miles south reaches an elevation of 7,852 feet above MSL. (*Ibid.*)

Impacts

a. Seismic/Fault Activity

Seismic shaking has the potential to cause major damage to the proposed power plant's primary facilities, but likely would account for a very small portion of pipeline damage.⁶⁰ (Ex. 1, § 6.17.1.3.1; Ex. 17, p. 3.) The project is located within seismic zone 3, and Applicant's data search revealed ten earthquakes greater than magnitude 2 within the period 1970 to the present.⁶¹ (Ex. 1, §§ 6.17.1.1.2, 6.17.1.1.3, and Tables 6.17-1 & 2.)

Mr. Barrie testified that the Rocky Ledge fault "is the most important seismic source for the site in terms of the magnitude of seismic shaking." (3/21 RT 25-26; Ex. 17; Ex. 57.) He based his conclusion on the following facts about the Rocky Ledge fault:

- the fault is very active (having moved in the last 11,000 years);
- its relative close proximity to the proposed facility at 4,000 feet east (0.8 miles);

⁵⁹ Rocky Ledge, a generally north-south trending fault escarpment, likewise, is just northeast (0.8 miles) of the proposed project site. (Ex. 1, § 6.17.1; Ex. 56, p. 292.) It is one of the most prominent geomorphic features in the immediate vicinity of the project site. (*Ibid.*)

⁶⁰ This conclusion is drawn from the oral and written testimony of Applicant's geologist, Mr. Donald S. Barrie. (3/21 RT 18-25; Ex. 1, Ex. 17; Ex. 57; *see also* Ex. 58 &-Ex. 59.)

⁶¹ As delineated on Figure 16-2 of the 1998 edition of the California Building Code. (Ex. 56, pp. 292-293.)

- its long length, 13 to 20 kilometers, making it one of the longest faults in the area. (3/21 RT 25-26.)

Mr. Barrie estimated the peak horizontal ground acceleration for the project site resulting from a 6.5-magnitude maximum credible earthquake (MCE) on the Rocky Ledge fault to be approximately 0.56g.⁶² (Ex. 57, p. 4.)⁶³ Mr. Barrie concluded that the proposed conditions of certification would mitigate the seismic hazards associated with the proposed project. (3/21 RT 26-29; see Conditions **GEO-1 & 2**, adopted as modified herein.)

Staff concluded that its proposed conditions of certification would allow the engineer of record for the project's final design to develop appropriate design criteria to meet seismic concerns from an earthquake on the Rocky Ledge fault. (3/21 RT 48-53; Ex. 56, pp. 292-293; see Condition **GEO-1**, adopted as modified herein.)

Intervenor, Burney Resource Group presented evidence of record that identified five additional active or potentially active seismic sources near the proposed facility, and augmented the information concerning the Rocky Ledge fault. (3/21 RT 62-63; Ex. 58, Ex. 59.) Of those five, two are listed as unnamed segments lying in closer proximity to the proposed facility than the Rocky Ledge fault. (Ex. 58, p. 2.) Burney Resource Group's evidence suggests⁶⁴ that one of these faults may cross the proposed project's footprint. (3/21 RT 62-64, 68-71; Ex. 58, p.2; Ex. 59.)

On the other hand, Applicant and Staff presented evidence to demonstrate that:

⁶² By comparison, estimated peak horizontal ground acceleration for the proposed power plant from a 6.5 magnitude MCE on the Susanville fault, which lies six miles west of the power plant footprint, is 0.42g ("g" representing acceleration due to gravity). (Ex. 1, Table 6.17-1; Ex. 17, p. 3; Ex. 56, p. 293.)

⁶³ See supplemental direct testimony of Mr. Barrie, which was presented in response to Intervenor Burney Resources Group's successful motion to augment the record based upon newly discovered evidence. (3/7 RT 16-18, 127-128; cf. Ex. 57, Ex. 59.)

⁶⁴ This suggestion was inconclusive and does not support a finding in this Decision.

- the potential of surface rupture on a fault at the power plant footprint is very low because,
- there are no faults known to cross the proposed power plant location. (3/21 RT 22-24; 49-50; 59-60; Ex. 17, p. 3; Ex. 56, p. 292.)

In addition, the evidence of record demonstrates that the reconductoring corridor does not cross any known active faults. (Ex. 56, p. 292.) However, the reconductoring corridor crosses several unnamed quaternary age (inactive) faults located approximately 4 to 4.5 miles west of the proposed power plant footprint and a second quaternary age fault near Hatchet Mountain pass. (3/21 RT 25-43.) None of the faults is considered to have a significant impact on the reconductoring project since the existing transmission line towers to be used in the reconductoring effort are not known to straddle the faults. (Ex. 56, p. 293.)

In addition, Mr. Steve Baker, Staff's supervising engineer for both facility design and geology, testified that the Facility Design section's conditions of certification requires that the proposed project be constructed to comply with the relevant provisions of the California Building Code. (3/21 RT 53-55; see Condition **GENERAL-1**, *supra*; Ex. 56, p. 291.)

b. Liquefaction

Liquefaction is a condition in which a cohesionless soil may lose shear strength due to a sudden increase in pore water pressure. (Ex. 1, § 6.17.1.3.1; Ex. 17, p. 3; Ex. 56, p. 293.) One of the parameters used to assess the potential for liquefaction is the depth to ground water at the site under study. Generally the depth to ground water at a site should be less than 100 feet for liquefaction to be possible. The depth to groundwater beneath the proposed site is estimated to be in excess of 100 feet below existing grade based on depth to groundwater at a nearby oil field. Because the dense consolidated nature of the volcanics under

the site, the potential for liquefaction at the power plant site is considered negligible. (Ex. 56, p. 293.)

c. Subsidence

Hydrocompaction is the process of the loss of soil volume upon the application of water. Again, the soils at the site are dense enough that hydrocompaction is not considered to be a significant problem at the proposed power plant location. (Ex. 56, p. 293.)

Seismic settlement results when loose, unconsolidated sediments such as lake sediments and alluvium settle in response to seismic shaking. (Ex. 17, p. 3; Ex. 56, pp. 293-294.) The potential for seismic and non-seismic subsidence/settlement is considered low due to the presence of hard volcanic rock beneath much of the project area. (*Ibid.*)

Lava tubes are known to occur near Burney; however, no lava tubes are known to cross the power plant footprint. Heavy structures built over lava tubes with a thin overburden of soil and/or rock may cause the roof of the tube to collapse and the structure to fall into the tube. Other than the potential of an unknown lava tube roof collapse, subsidence of the soil or rock beneath the power plant footprint is unlikely since the soil veneer over the basalt is thin and the basalt is very dense. (Ex. 56, pp. 293-294.)

d. Expansion

Soils that contain a high percentage of expansive clay minerals may be prone to expansion, if subjected to an increase in water content. Expansive soils are usually measured with an index test such as the expansive index potential. In order for a soil to be a candidate for testing, the soil must have high clay content and the clay must have a high shrink-swell potential and a high plasticity index.

This soil has a low shrink-swell potential, therefore we conclude that the potential for expansive soil at the site is negligible. (Ex. 56, p. 294.)

e. Landslides

Landslide and slope instability are influenced by a number of factors, including:

- slope angle;
- soil moisture content;
- vegetation cover; and
- physical characteristics of surface and subsurface earth materials (Ex. 17, p. 4.)

Due to the gently sloping terrain at the project site and the lack of geomorphic features related to slope instability, we conclude that landslides are not a potential hazard at the proposed project site. (*Ibid.*)

f. Erosion

The proposed project site occurs on gently sloping volcanic terrain with very shallow soil development. (Ex. 17, p. 3.) Applicant's review of available maps demonstrates that the potential for soil erosion by water and wind is considered low for the project area. (*Ibid.*) The power plant site will be graded, covered with gravel and concrete, and will contain surface water drainage features. (See the **Soils and Water** section of this Decision.)

COMMISSION DISCUSSION

The project is located within seismic zone 3.⁶⁵ The weight of the evidence while by no means conclusive at this point at least supports the contention that no active faults are known to cross the proposed power plant footprint. Intervenor's witness Mr. John Pfeiffer stated that he was "not entirely comfortable with that,"

⁶⁵ As delineated on Figure 16-2 of the 1998 Edition of the California Building Code.

when asked about Applicant's and Staff's prior testimony indicating that certain fault segments do not cross the footprint of the plant site. (3/21 RT 64.) On cross-examination and throughout his testimony, Mr. Pfeiffer asserted that his review of the quaternary maps indicated to him that a fault appeared to "across the plant site, or in very close proximity to it" and that "it is either under the plant site or in close proximity to it, being to the east. I couldn't say more definitively than that." (3/21 RT 70-71; Ex. 58, Ex. 59.)

All parties agree that the California Building Code, in section 16, addresses seismic safety and design requirements. (3/21 RT 30-34, 51, 53-55; 65-66; see CCR, tit. 24, chap. 16.) The proposed conditions did not explicitly reference section 16 as the Intervenor preferred, even though Staff and Applicant were of the opinion that the proposed conditions did, by implication at least, incorporate those requirements. (*Ibid.*) To ensure compliance with section 16, we have amended Conditions **GEO-1 & GEO-2** as requested by Mr. Pfeiffer and BRG. (3/21 RT 44-46, 66; 72-74.) Accordingly, we are satisfied that the conditions of certification appropriately serve to mitigate any significant adverse effects of the proposed project to a level of insignificance. (3/21 RT 52-53.)

We conclude that:

- our Conditions will mitigate any potential impacts to paleontological resources associated with construction of the proposed project;
- the project is not likely to have any significant impact on geological or paleontological resources, or surface water resources, and is likely to withstand any above-described geological event; and
- no cumulative impacts are likely based upon the lack of known significant paleontological or geological resources at the proposed site.

FINDINGS AND CONCLUSIONS

Based upon the uncontroverted evidence of record, we find and conclude as follows:

1. The proposed project and reconductoring corridors are located within a volcanically active area.
2. The proposed project is located in an area characterized by active faults and seismic activity.
3. Although the possibility exists, no active faults are known to cross the proposed power plant footprint, however, several faults cross the transmission line corridor that is to be reconductored.
4. The potential for fault rupture at the site is low.
5. The geology conditions of certification are adequate and appropriate mitigation to address seismic impacts.
6. Seismic shaking has the potential to cause major damage to the proposed power plant's primary facilities, but likely would account for a very small portion of pipeline damage
7. Geological and paleontological resources exist in the area of the proposed project
8. Construction and ground disturbance activities associated with the construction of the Three Mountain Power Project can potentially impose direct, indirect, and cumulative impacts to paleontological resources.
9. Mitigation measures required by the Conditions of Certification will assure that the activities associated with the Three Mountain Power Project will cause no direct, indirect, or cumulative adverse impacts to paleontological resources.
10. The Three Mountain Power Project will have no significant adverse impact on surface water hydrology.
11. The Three Mountain Power Project will have no significant adverse impact on geological or paleontological resources.

We therefore conclude that the project will not cause any unmitigated significant adverse direct, indirect, or cumulative impacts to geological or paleontological resources. Implementation of the Conditions of Certification will ensure that the project is constructed and operated in compliance with applicable laws, ordinances, regulations, and standards identified in the appropriate portion of Appendix A of this Decision.

CONDITIONS OF CERTIFICATION

GEO-1 Prior to the start of construction, the project owner shall assign to the project an engineering geologist(s), certified by the State of California, to carry out the duties required by the 1998 edition of the California Building Code (CBC), Appendix Chapter 16 and Chapter 33, Section 3309.4. The certified engineering geologist(s) assigned must be approved by the CPM. The functions of the engineering geologist can be performed by the responsible geotechnical engineer, if that person has the appropriate California license.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the Chief Building Official (CBO)) prior to the start of construction, the project owner shall submit to the CPM for approval the name(s) and license number(s) of the certified engineering geologist(s) assigned to the project. The submittal should include a statement that CPM approval is needed. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of its findings within 15 days of receipt of the submittal. If the engineering geologist(s) is subsequently replaced, the project owner shall submit for approval the name(s) and license number(s) of the newly assigned individual(s) to the CPM. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of the findings within 15 days of receipt of the notice of personnel change.

GEO-2 The assigned engineering geologist(s) shall carry out the duties required by the 1998 CBC, Chapter 16, Appendix Chapter 33, Section 3309.4 Engineered Grading Requirement, and Section 3318.1 - Final Reports. Those duties are:

1. Prepare the Engineering Geology Report, which shall include compliance with the seismic design requirements of Chapter 16. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit.
2. Monitor geologic conditions during construction.
3. Prepare the Final Engineering Geology Report.

Protocol: The Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3309.3 Grading Designation, shall include an adequate description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and an opinion on the adequacy of the site for the intended use as affected by geologic factors. This report shall consider faults reflected in fault maps by T. L. Sawyer entitled "Quaternary Faults of the Modoc Plateau, Southern Cascade Range Borderland" and "Quaternary Fault Map of the Pit River Region," and estimates of peak ground acceleration based on the report, "Potential Seismic Source for Pit No. 4 Dam, Shasta County, California," by Thomas L. Sawyer, November 1998.

The Final Engineering Geology Report to be completed after completion of grading, as required by the 1998 CBC Appendix Chapter 33, Section 3318.1, shall contain the following: A final description of the geology of the site and any new information disclosed during grading; and the effect of same on recommendations incorporated in the approved grading plan. The engineering geologist shall submit a statement that, to the best of his or her knowledge, the work within their area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of this chapter.

Verification: (1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations contained in the report are incorporated into the plans and specifications. (2) Within 90 days following completion of the final grading, the project owner shall submit copies of the Final Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3318 Completion of Work, to the CPM and the CBO.

PAL-1 Prior to the start of any project-related construction activities (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall ensure that the designated paleontological resource specialist approved by the CPM is available for field activities and prepared to implement the conditions of certification.

The designated paleontological resources specialist shall be responsible for implementing all the paleontological conditions of certification and for using qualified personnel to assist in this work.

Protocol: The project owner shall provide the CPM with the name and statement of qualifications for the designated paleontological resource specialist.

The statement of qualifications for the designated paleontological resources specialist shall demonstrate that the specialist meets the following minimum qualifications: a degree in paleontology or geology or paleontological resource management; and at least three years of paleontological resource mitigation and field experience in California, including at least one year's experience leading paleontological resource mitigation and field activities.

The statement of qualifications shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

If the CPM determines that the qualifications of the proposed paleontological resource specialist do not satisfy the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

If the approved, designated paleontological resource specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontological resource specialist by submitting the name and qualifications of the proposed replacement to the CPM, at least ten (10) days prior to the termination or release of the preceding designated paleontological resource specialist.

Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

Verification: At least sixty days prior to the start of construction, the project owner shall submit the name and resume and the availability for its designated paleontological resource specialist, to the CPM for review and approval. The CPM shall provide written approval or disapproval of the proposed paleontological resource specialist.

At least ten days prior to the termination or release of a designated paleontological resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated paleontological resource specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

PAL-2 Prior to the start of project construction, the designated paleontological resource specialist shall prepare a Paleontological Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontological resources, and submit this plan to the CPM for review and approval. After CPM approval, the project owner's designated paleontological resource specialist shall be available to implement the Monitoring and Mitigation Plan, as needed, throughout project construction.

In addition to the project owner's adoption of the guidelines of the Society of Vertebrate Paleontologists (SVP 1994) the Paleontological Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:

1. A discussion of the sequence of project-related tasks, such as any pre-construction surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation;
2. Identification of the person(s) expected to assist with each of the tasks identified within this condition for certification, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities;
3. Where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur and a schedule for the monitoring;
4. An explanation that the designated paleontological resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined;
5. A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
6. Inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontological resources; and
7. Identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work, discussion of any requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution.

Verification: At least sixty days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the Monitoring

and Mitigation Plan prepared by the designated paleontological resource specialist for review and approval. If the plan is not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes.

PAL-3 Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated paleontological resource specialist shall prepare and conduct CPM-approved training to all project managers, construction supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontological resources or deposits that may be discovered during project-related ground disturbance.

Protocol: The paleontological training program shall discuss the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall also include the set of reporting procedures that workers are to follow if paleontological resources are encountered during project activities. The training program shall be presented by the designated paleontological resource specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least thirty days prior to the start of project construction, the project owner shall submit to the CPM for review, comment, and written approval, the proposed employee training program and the set of reporting procedures the workers are to follow if paleontological resources are encountered during project construction.

If the employee training program and set of procedures are not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes, before the beginning of construction.

Documentation for training of additional new employees shall be provided in subsequent Monthly Compliance Reports, as appropriate.

PAL-4 The designated paleontological resource specialist shall be present at all times he or she deems appropriate to monitor construction-related grading, excavation, trenching, and/or augering in areas where potentially fossil-bearing sediments have been identified. If the designated paleontological resource specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner.

Verification: The project owner shall include in the Monthly Compliance Reports a summary of paleontological activities conducted by the designated paleontological resource specialist.

PAL-5 The project owner, through the designated paleontological resource specialist, shall ensure recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files copies of signed contracts or agreements with the designated paleontological resource specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation for and delivery of all significant paleontological resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resources Report and shall keep these files available for periodic audit by the CPM.

PAL-6 The project owner shall ensure preparation of a Paleontological Resources Report by the designated paleontological resource specialist. The Paleontological Resources Report shall be completed following completion of the analysis of the recovered fossil materials and related information. The project owner shall submit the paleontological report to the CPM for approval.

Protocol: The report shall include (but not be limited to) a description and inventory list of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the paleontological resource specialist that project impacts to paleontological resources have been mitigated.

Verification: The project owner shall submit a copy of the Paleontological Resources Report to the CPM for review and approval under a cover letter stating that it is a confidential document. The report is to be prepared by the designated paleontological resource specialist within 90 days following completion of the analysis of the recovered fossil materials.

PAL-7 The project owner shall include in the facility closure plan a description regarding facility closure activity's potential to impact paleontological resources. The conditions for closure will be determined when a facility closure plan is submitted to the CPM twelve months prior to closure of the facility. If no activities are proposed that would potentially impact paleontological resources, then no mitigation measures for paleontological resource management are required in the facility closure plan.

Protocol: The closure requirements for paleontological resources are to be based upon the Paleontological Resources Report and the proposed grading activities for facility closure.

Verification: The project owner shall include a description of closure activities described above in the facility closure plan.

VIII. LOCAL IMPACT ASSESSMENT

All aspects of a power plant project affect to some degree the community in which it is located. The impact on the local area depends upon the nature of the community and the extent of the associated impacts. Technical topics discussed in this portion of the Decision consider issues of local concern, including land use, traffic and transportation, visual resources, noise, and socioeconomics.

A. LAND USE

The land use analysis focuses on two main issues: 1) whether the project is consistent with local land use plans, ordinances, and policies; and 2) whether the project is compatible with existing and planned land uses.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The Three Mountain Power Project (TMPP) is proposed for the Burney/Johnson Park Planning Area, which falls within the jurisdiction of Shasta County. (Ex. 1, § 6.3.) Hence, the Shasta County General Plan (SCGP) policies, and the Shasta County Zoning Ordinance sections, are the ordinances and policies relevant to the proposed project. (Ex. 56, pp. 81-84.) Although the SCGP provides no specific policies for power plant development, there are many applicable standards for industrial development. (Ex. 1, § 6.3.1.1.1.)

The SCGP designates TMPP's proposed site for industrial use (map symbol "I"); the site is zoned General Industrial (M) combined with a Design Review (DR) district designation under the Shasta County Zoning Map. (3/21 RT 96-102.) The zoning plan includes power-generating plants as a use permitted in the general industrial district if a use permit is issued. (3/21 RT 98; see **Land Use Table 1** in Ex. 56, p. 86.)

LAND USE Table 1
General Plan Designations and Zoning Districts within Project Study Area

LAND DESIGNATION	USE	GENERAL PLAN MAP SYMBOL	ZONING MAP SYMBOL	DEFINITION
AGRICULTURAL AREAS Agricultural Croplands		AC	U	Unclassified
			EA-AP	Exclusive Agriculture/ Agricultural Preserve
Timberland		T	TP	Timber Production
			TL	Timberland
COMMERCIAL AREAS Commercial		C	C-2	Community Commercial
			C-M	Commercial Light Industrial
			C-M-DR	Commercial Light Industrial/ Design Review
RESIDENTIAL AREAS Rural Residential		RB	R-L	Limited Residential
Suburban Residential		SR	IR	Interim Rural Residential
			MHP	Mobile Home Park
Public Facilities		PF	PF	Public Facilities
INDUSTRIAL		I	M-DR	General Industrial/Design Review
			M-L-DR	Light Industrial/Design Review

Source: (Ex. 56, p. 87.)

Shasta County's Planning Department has indicated that it, under normal circumstances, would issue an exemption to development standards under its zoning plan, which would be required for construction of the proposed project. (3/21 RT 99-102, 105; Ex. 56, pp. 97-98.) In particular, structural height requirements would require such an exemption for Three Mountain. (3/21 RT 99-100.) Evidence of record demonstrates that Shasta County issued such an exemption for construction of an energy facility on the identical parcel proposed for Three Mountain. (*Ibid.*)

Moreover, because the Energy Commission's jurisdiction extends to thermal power plants 50 megawatts or larger under an equivalent CEQA process, Shasta County has agreed that a use permit from the County is not required. (3/21 RT 100-102; Ex. 56, pp. 98-99.)

In addition, Staff has proposed conditions of certification that contain the requirements that Shasta County recommended be placed on any approval of the project, which would have presumably been placed on a use permit. (3/21 RT 100-102; Ex. 56, p. 99; see Conditions **LAND-1-5**, below.) We conclude that Energy Commission adoption of these conditions in the Decision would achieve compliance with the use permit requirements of the Zoning Plan.

The proposed use of the site is compatible with adjacent land uses, which include undeveloped timber production, industrial, and limited rural residential lands. (Ex. 11, p. 3; Ex. 56, p. 101.) We conclude that the proposed project represents further development of an area that is already committed to energy-related industrial uses and therefore would not constitute a change in the current development pattern of the area. (*Ibid.*) We further conclude that project operation would not significantly impact surrounding land uses. (*Ibid.*)

The proposed project requires the existing lot to be split into two portions, one for the existing Burney Mountain Power (BMP) facility currently occupying the site and one for Three Mountain.⁶⁶ (3/21 RT 108-133; Ex. 11, p. 3; Ex. 56, p. 100; see Conditions **LAND-1 & LAND-2**.)

⁶⁶ The Fruit Growers Supply Company owns the property, which it leases to BMP under an agreement extending to 2022. (Ex. 11, Att. 3; Ex. 56, p. 85.) Although the life of the project is estimated at 35 years, BMP has the option to extend the existing lease for two additional terms of ten years each. (Ex. 11, Att. 3.) BMP now operates a 10 MW biomass-fired power plant that is located on the northern portion of the 40-acre site. (*Ibid.*)

The proposed project's site is:

- situated approximately one mile northeast of the unincorporated town of Burney;
- located along the west side of SR 299, approximately one mile north of the intersection of SR 299 and Black Ranch Road;
- accessed from a paved private access road (Energy Drive);
- developed on approximately 10.2 acres of an existing 40-acre site;
- traversed north to south by a 100-foot easement (two-thirds of the 40-acre property lies east of the right-of-way), which accommodates the McCloud River Railway Company owned single-track, railroad right-of-way; and
- bordered to the southwest by the BWD-owned and operated Burney Wastewater Treatment Plant, and bordered on all other sides by forested land. (Ex. 56, pp. 85-86.)

Sensitive land uses within one mile of the site are:

- residences located to the north in the small community of Johnson Park (the closest residences are approximately one-half mile away); and
- a single-family residence approximately 1,400 feet west of the site, on Black Ranch Road.⁶⁷ (Ex. 56, pp. 85; see **Figure 1**, below.)

⁶⁷ Residential developments planned within 1,000 and 2,000 feet of the proposed site have been essentially abandoned. Even if the projects were to go forward, distance and existing trees would buffer them from the site. (3/21 RT 103-104; Ex. 56, pp. 102, 104.)

TMPP's power island and cooling tower, and a PG&E switchyard⁶⁸ would all be developed within the existing 40-acre industrial site.⁶⁹ (Ex. 11, p. 2.)

Route A is the proposed 2,900-foot route for the natural gas supply pipeline, which would tie in from the proposed facility to an existing PG&E pipeline, located on the southeast side of SR 299.⁷⁰ (Ex. 56, p. 85.) Route A is accessible from SR 299 (via a paved maintenance road), and from the existing PG&E pipeline route (via a parallel, unpaved access road), and it will not require any timberland removal. (Ex. 56, pp. 85, 90.) **LAND USE Table 2** shows land use designations and zoning districts crossed by proposed Route A.

LAND USE Table 2
General Plan Designations and Zoning Districts
Proposed Route A Natural Gas Tie-in Pipeline Route

GENERAL PLAN	ZONING
I: Industrial	M-DR: General Industrial/Design Review
I: Industrial	M-L-DR: Light Industrial/Design Review
SR: Suburban Residential	TL: Timberland
T: Timberland	TP: Timber Production

Source: (Ex. 56, p. 90.)

Sensitive land uses within Route A's 0.5-mile corridor include:

⁶⁸ The project will require reconductoring of two existing 230 kV transmission lines for a distance of about 60 linear miles: 19 miles from the new transmission line tie-in to the Round Mountain Substation; 9 miles to the Pit 3 Substation; and, 32 miles from the Round Mountain Substation to the Cottonwood Substation, located south of the city of Anderson. (Cf. Ex. 56, p. 96.) The AFC's project description states that 88 miles of transmission line will be reconductored; however, that consists of 28 miles of a double circuit line (counted as 56 miles) and 32 miles of a single circuit for a total linear distance of 60 miles. (*Ibid.*) Reconductoring of the PG&E 230kV transmission system will not result in a land use impact because there will be no change in land use associated with the reconductoring. (Ex. 1, § 6.3.)

⁶⁹ The LAND USE Figures (Figures 1-3) in Ex. 56 show existing land uses, designations and zoning districts, respectively, within one mile of the proposed power plant site, and within 0.25 mile to either side of the proposed linear facilities (natural gas and water pipelines, and electrical transmission facilities). (Ex. 1, § 6.3; Ex. 56, pp. 86; 88-89.)

- a residence approximately 1,800 feet away on Black Ranch Road to the south;
- residences approximately 1,800 feet away in Johnson Park to the north;
- urban developments in Burney approximately one mile southwest. (3/21 RT 102-103; Ex. 56, p. 85.)

There are no proposed residential developments in the 0.5-mile corridor along the proposed natural gas supply line route. (Ex. 56, p. 251.)

Applicant proposes to construct a 4,700-foot, 24-inch water supply pipeline from the power plant to new water wells. (Ex. 56, p. 90.) If BWD supplies the water, it would also construct a new 14-inch, approximately 3,000-foot pipeline from the new wells to Applicant's proposed water storage tank near Mountain View Road. (Ex. 56, p. 90.) The proposed water supply pipeline(s) would:

- follow existing roadways and new rights-of-way; and
- pass within 3,600 feet of urban development in Burney, within 1,800 feet of a residence on Black Ranch Road, and within 3,300 feet of residences in Johnson Park. (Ex. 56, p. 90.)

⁷⁰ The AFC proposed three natural gas tie-in line alternatives from which Applicant chose Alternative A (Route A). (Exs. 1, § Table 6.3-3; 11, p. 2; 56, p. 85.)

LAND USE Table 3 shows General Plan land use designations and their corresponding zoning districts for the water supply pipeline.

**LAND USE Table 3
General Plan Designations and Zoning Districts
Water Supply Pipeline**

GENERAL PLAN	ZONING
I: Industrial	M-DR: General Industrial/Design Review
I: Industrial	M-L-DR: Light Industrial/Design Review
SR: Suburban Residential	TL: Timberland
T: Timberland	TP: Timber Production

Source: (Ex. 56, p. 95.)

Applicant proposes to construct a 2,600-foot electrical transmission tie-in line that would follow the rail-line (on the west side) to the existing PG&E 230 kV transmission lines. (Ex. 56, p. 95; see **Table 4** below.) The proposed electrical transmission tie-in route passes within approximately 1,800 feet of a residence on Black Ranch Road, and residences in Johnson Park.⁷¹ (*Ibid.*)

**LAND USE Table 4
General Plan Designations and Zoning Districts
Electrical Transmission Tie-in Lines**

GENERAL PLAN	ZONING
I: Industrial	M-DR: General Industrial/Design Review
T: Timberland	TP: Timber Production

Source: (Ex. 56, p. 95.)

⁷¹ **LAND USE Figures 2-4** show General Plan and zoning district designations crossed by the electrical transmission tie-in line. (Ex. 56, pp. 88-89, 91.) Land designated Rural Residential B (RB) and zoned Limited Residential (R-L) lies within 0.1 mile west of the route. (*Ibid.*)

FINDINGS AND CONCLUSIONS

Based on the evidence of record as a whole, the Commission makes the following Findings:

1. The Three Mountain Power Project is consistent with the policies expressed in the Shasta County General Plan and the relevant provisions of the Shasta County Zoning Ordinance.
2. Shasta County's General Plan and zoning conditions of approval, which would otherwise be imposed if the county were the permitting agency, have been incorporated in our Conditions of Certification.
3. Three Mountain Power Project's proposed site is compatible with adjacent land uses, which include undeveloped timber production, industrial, and limited rural residential lands.
4. Three Mountain Power Project represents further development of an area that is already committed to energy-related industrial uses and therefore would not constitute a change in the current development pattern of the area.
5. Three Mountain Power Project's linear components are permitted uses under the Shasta County General Plan and applicable zoning ordinances.
6. There are no potential cumulative impacts arising from construction and operation of the Three Mountain Power Project's.

The Commission therefore concludes that the project will not create any significant direct, indirect, or cumulative adverse land use impacts. Implementation of the Conditions of Certification, below, ensures that the project will comply with all applicable laws, ordinances, regulations, and standards relating to land use as identified in the pertinent portions of APPENDIX A of this Decision.

CONDITIONS OF CERTIFICATION

LAND-1 The project owner shall comply with the Shasta County Zoning Ordinance site development standards for the general industrial (M) district (Chapter 17.58.050).

Protocol: The project owner shall submit to the CEC Compliance Project Manager (CPM) for review and approval a site plan that indicates how the development standards listed in the section will be met. The submittal shall include evidence that Shasta County has reviewed the plans and shall attach and address any recommendations from Shasta County. The project owner shall not implement the plans until approved by the CPM.

Verification: At least 60 days prior to the start of construction of the proposed project, the project owner shall submit the site plans to the CPM for review and approval.

LAND-2 Prior to final approval of any proposed land division to create a separate parcel for the Burney Mountain Power Plant allowed by Shasta County Use Permit Number 3-83, the project owner shall ensure that the plot plan and conditions of UP 3-83 are changed as appropriate to reflect the proposed plant and/or property segregation.

Verification: The project owner shall ensure that the revised plot plan and conditions of UP 3-83 are filed with Shasta County and shall provide evidence of the filing with the CPM.

LAND-3 The project owner shall place a screened cyclone fence with a six foot minimum height along the northern property line adjacent to the property within the Timber Production (TP) district in accordance with the Shasta County rural zone wall requirement (Zoning Plan Section 17.84.070). The fence shall be completed prior to final building permit inspection.

Verification: At least 30 days prior to final building permit inspection, the project owner shall submit to the CPM evidence that the fence has been constructed. Within seven (7) days after receiving written notification of the results of the final building inspection, the project owner shall submit the results to the CPM.

LAND-4 The project owner shall provide an improved parking area in accordance with Shasta County Ordinance Code Section 17.86. Improvements shall be completed prior to final building inspection.

Protocol: The project owner shall provide a parking plan showing space location, dimensions and total number of spaces. A minimum of 25 spaces shall be provided based on 1 space per employee and a maximum of 25 employees proposed.

The parking area and access shall be improved to the following standard:

- a. Surfaced with asphalt concrete paving. Asphalt concrete paving shall be type "B": with a minimum thickness of 0.14 feet placed over at least six (6) inches of compacted class 3 aggregate base or cinders.
- b. Parking areas shall be striped.

All other internal access roads and driveways shall be surfaced with a minimum of four (4) inches of compacted "Class 3" aggregate base or cinders and maintained in a dust free condition.

Verification: At least 60 days prior to the start of construction of the project, the project owner shall submit the parking plan to the CPM for review and approval. The submittal to the CPM shall include evidence that the plan has been reviewed by Shasta County and shall include any recommendations from Shasta County.

At least 30 days prior to final building permit inspection, the project owner shall submit to the CPM evidence that the parking plan has been implemented.

LAND-5 The property is located in an agricultural/timber use area and may be subject to impacts from the conduct of existing and future agricultural/timber related activities that may be considered objectionable. The project owner shall provide any prospective purchaser with a copy of Shasta County Ordinance No. 94-2 and shall comply with the disclosure provisions of that ordinance.

Verification: As part of any petition to the Energy Commission to transfer ownership of the project parcel the project owner shall provide a statement from the prospective purchaser that the project owner has satisfied this condition.

B. TRAFFIC AND TRANSPORTATION

Construction and operation of the project have the potential to adversely impact the transportation system in the project vicinity. During the construction phase, large numbers of workers arriving and leaving during peak traffic hours and transportation of large pieces of equipment could increase roadway congestion and affect traffic flow. Trenching and other activities associated with building the linear facilities may also be disruptive. During plant operation, there is reduced potential for impacts due to the limited number of vehicles involved. On-going (post construction) operations and maintenance traffic will be minimal, but it will include a slight increase in the transportation of hazardous materials to the project site. In all cases, the transportation of hazardous materials will comply with federal and state laws.

The evidentiary record contains a review of the roads and routings that will be used; the potential traffic problems associated with those routes; the anticipated number of deliveries of oversized/overweight equipment; anticipated encroachments upon public rights-of-way; the frequency of, and routes associated with the delivery of hazardous materials; and the availability of alternative transportation methods.

SUMMARY AND DISCUSSION OF THE EVIDENCE

State Routes 89 and 299 provide regional and local access to the TMPP site. State Route 89 is a two-lane, north/south facility located approximately five miles east of the TMPP site. Near its intersection with State Route 299, State Route 89 carries approximately 3,000 vehicles per day during the peak month (month of heaviest traffic flow). (Ex. 12, p. 2.)

State Route 299, in the vicinity of the TMPP site, is a two-lane undivided highway ranging in width from 22 to 48 feet without any weight restrictions between I-5 and State Route 89. The section of State Route 299 east of the TMPP site through Johnson Park is a four-lane undivided highway. Near the TMPP site,

State Route 299 carries approximately 5,700 vehicles per day during the peak month. Vehicular access to the TMPP site is currently provided along State Route 299 via Energy Drive. TMPP will maintain this vehicular access point. Energy Drive will continue to serve as the single access driveway. (Exhibit 56, p. 116.) Vehicles will predominantly travel to the site from the west via State Route 299 from I-5 in Redding. Primary vehicular impacts associated with construction and operation of this plant will occur on State Route 299. (Ex. 12, p. 2.)

The operating conditions of a roadway system are described using the term "level of service" (LOS). LOS is a description of a driver's experience at an intersection or roadway based on the level of congestion (delay). It is not a measure of safety or accident potential. Intersection and roadway conditions can range from LOS A, representing free-flow conditions with little or no delay, to LOS F, representing saturated conditions with substantial delay. A LOS C threshold, is the minimum condition deemed acceptable by Caltrans for State Route 299. This level of service standard is also generally considered appropriate for rural areas. (Ex. 56, p. 116.) Table 1, below, based on Exhibit 1, Table 6.5-1, compares the various criteria for LOS. Table 2, below, based on Exhibit 1, Table 6.5-2, summarizes the existing traffic volumes of State Route 299 in the project area. All local roadways are operating at LOS C or better. Field observations confirmed the lack of delays caused by congestion. (Ex. 56, pp. 116-117.)

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Table 1
LEVEL OF SERVICE CRITERIA
FOR SIGNALIZED, UNSIGNALIZED AND ALL-WAY STOP CONTROLLED INTERSECTIONS

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle (seconds)		
				Signalized	Unsignalized	All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase and not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	< 5.0		
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	5.1 - 15.0	5.1 - 10.0	5.1 - 10.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Backups may develop behind turning vehicles. Most drivers feel somewhat restricted.	15.1 - 25.0	10.1 - 20.0	11.0 - 20.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary backups.	25.1 - 40.0	21.0 - 30.0	21.0 - 30.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	40.1 - 60.0	31.0 - 45.0	31.0 - 45.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with oversaturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Backups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream backup conditions.	> 60.0	> 45.0	> 45.0

Sources: Highway Capacity Manual, Special Report No. 209, Transportation Research Board, 1985.
Highway Capacity Manual, Special Report No. 87, Highway Research Board, 1965.

Source: Exhibit 1, Table 6.5-1.

Table 2

**ROADWAY TRAFFIC CHARACTERISTICS
EXISTING CONDITIONS**

Roadway	Mile Post	Location	Classification	Average Daily Traffic Volume ₂	Peak Hour Traffic Volume ²	Annual Average Daily Truck Traffic	Percentage of Truck Traffic ³	Peak Hour Level of Service ₄
SR 299	73.13	Tamarack Road to Plumas Street (Burney)	2-Lane Conventional ¹	3,300	480	759	23%	C
SR 299	74.98	Plumas Street to Black Ranch Road	2-Lane Conventional ¹	9,200	1,050	644	7%	C
SR 299	76.18	Black Ranch Road to Energy Drive	2-Lane Conventional ¹	5,600	660	896	16%	C
SR 299	78.65	Energy Drive to Pine Street (Johnston Park)	2-Lane Conventional ¹	5,400	680	864	16%	C

¹ Based upon Caltrans roadway facility types.

² Source: Caltrans 1996 Traffic Volumes on California State Highways

³ Source: Caltrans 1995 Annual Average Daily Truck Traffic on California State Highways

⁴ Based upon peak hour 2-lane highway HCM methodology.

Source: Exhibit 1, Table 6.5-2

1. Construction Impacts

Commuter Traffic: The construction schedule is based on a single-shift, eight-hour day, five-day workweek. The construction workforce will peak at approximately 400 persons (including engineering staff) and average about 200 persons over a 22-month period. The majority of the construction workforce will likely come from the local labor pool in the Redding area. As a result, State Route 299 is likely to be the principal commute route. Construction workers will park on site, although no specific location is given in the AFC. (Ex. 56, p. 117.)

During peak construction periods, the following sections of State Route 299 would operate at a level worse than Caltrans LOS C:

- State Route 299 between Tamarack Road and Plumas Street
- State Route 299 between Plumas Street and Black Ranch Road
- State Route 299 between Black Ranch Road and Energy Drive

TMPP construction activities would also add a significant amount of traffic at the intersection of State Route 299 and Energy Drive, the access driveway. Applicant's analysis indicates that, during peak construction periods, the intersection would operate at an acceptable LOS. Applicant completed a queuing analysis to determine the maximum expected queue for the northbound left-turn approach at the intersection. This analysis indicated a maximum queue of two vehicles. Staff found, however, that the description of the number of trips created by construction worker and materials delivery was incomplete and, in some cases, contradictory. Staff found the actual maximum queue to be as high as four. Assuming that these vehicles are all trucks, the maximum queue length would be approximately 200 feet. The increase in traffic volumes will not warrant a traffic signal. (Ex. 56, pp. 117-118.)

Staff consulted with Caltrans and Shasta County, and recommends the applicant prepare a construction traffic control plan and a construction traffic management plan that will address commuter peak periods. The development and implementation of a traffic control plan will

primarily address the safety of travel to/from the site. The plan may result in reduced travel during the peak hours by shifting to alternative times. However, the degree of travel reduction or time shift is unknown and it is unlikely to significantly change travel patterns because of the nature of construction activities. We adopt that recommendation and incorporate it into the conditions, below. (See Condition **TRANS-5**.) In addition, the applicant will provide a northbound left turn lane on State Route 299 at Energy Drive. This lane should extend at least 200 feet and comply with Caltrans Design Standards. (Ex. 56, p. 118. See also Condition **TRANS-4** that requires the installation of the left turn lane in advance of project construction.)

Truck Traffic: Construction of the generating plant will require the use and installation of heavy equipment and associated systems and structures. Heavy equipment will be used throughout the construction period, including trenching and earthmoving equipment, forklifts, cranes, cement mixers and drilling equipment. In addition to deliveries of heavy equipment, construction materials such as concrete, wire, pipe, cable, fuels and reinforcing steel will be delivered to the site by truck. The transportation and handling of hazardous substances associated with the project can increase roadway hazard potential. (Ex. 56, p. 118.) The handling and disposal of hazardous substances are addressed in the **Waste Management** section and the **Hazardous Materials** section of this Decision. Potential impacts of the transportation of hazardous substances can be mitigated to insignificance by compliance with federal and state standards established to regulate the transportation of hazardous substances. We have included conditions of certification to ensure compliance with these standards. (See Conditions **TRANS-1 through TRANS-3**.)

Transportation of equipment exceeding the load size and weight limits of any roadways will require special permits. The procedures and processes for obtaining such permits are fairly straightforward. The conditions of certification described herein will ensure compliance. In addition, product deliveries via truck traffic will produce localized impacts. While such traffic will average 745 trips per day during peak construction, such activities as concrete pouring can produce sufficient traffic to produce a noticeable impact on local roadways. Depending

upon the timing of deliveries during the day there can be localized traffic related noise and conflict with local traffic patterns. Applicant will prepare a construction traffic control plan and a construction traffic management plan that will address truck deliveries during peak periods. The addition of 745 heavy vehicle trips per day during peak construction could damage the roadbed of State Route 299 and would need to be repaired by the applicant. We have included conditions of certification to ensure compliance.

Railways: The McCloud River Railway crosses State Route 89 north of State Route 299 at a controlled location (gates and signals). The applicant is proposing to use the railroad during the construction of the TMPP to deliver heavy equipment, but no hazardous materials. The applicant estimates a total of 10 trips on the railway, which will not create any significant impact. The TMPP will add approximately 68 trips per day to the crossing at State Route 89, which will not create any significant impacts. (Ex. 56, p. 119.)

Linear Facilities: Construction of the transmission lines is not expected to occur within the public right-of-way and is not expected to cause any traffic impacts.

The construction of the underground natural gas pipeline alternatives from the PG&E natural gas transmission line to the TMPP could increase congestion for all roadways in which trenching is required within the established right-of-way. However, such impacts will be short-term and not significant. Typically plating of roadways will be used to ensure emergency vehicle access and maintain reasonable levels of traffic flow. Use of typical signals, signs, or warnings will also notify motorists of construction activity. Any exceptional need for traffic control and signing for this area will be addressed in the construction traffic control plan as specified in the conditions of certification. (Ex. 56, pp. 119-120.)

The construction of the underground water supply pipeline alternatives from the Burney Water District to the TMPP could increase congestion for all roadways in which trenching is required within the established right-of-way. Any exceptional needs for traffic control and signing for this area will be addressed in the construction traffic control plan as specified in

the conditions of certification. In all cases, construction within the public right-of-way will need to comply with Caltrans "Manual of Traffic Controls for Construction and Maintenance of Work Zones" (Ex. 56, p. 120.)

If either natural gas or water supply facilities are being constructed within or adjacent to a public roadway, the traffic control plan shall include a provision for keeping at least one lane open in each direction or an alternating traffic flow pattern, using flagmen. The operation of such facilities will not have an impact on area roadways except for short-term maintenance or unplanned difficulties. In either case, the impacts create traffic flow difficulties that are typically limited in duration and not significant. (Ex. 56, p. 120.)

2. Operation Impacts

Commute Traffic: The operational phase of the TMPP will generate a total of approximately 100 daily vehicle trips. This will not create any significant traffic impacts. (Ex. 56, p. 119.)

Truck Traffic: The transportation and handling of hazardous substances associated with the TMPP can increase roadway hazard potential. The handling and disposal of hazardous substances are addressed in the **Waste Management** section and the **Hazardous Materials** section of this Decision. Potential impacts of the transportation of hazardous substances can be mitigated to insignificance by compliance with Federal and State standards established to regulate the transportation of hazardous substances. The Commission has included mitigation measures and conditions of certification to ensure compliance with these standards. (see **TRANS-3.**) Product deliveries via truck traffic can produce localized impacts. While such traffic will average 20 trips per day, this will not present any noticeable impact on local roadways. (Ex. 56, p. 119.)

3. Cumulative Impacts

CEC staff is not aware of any development proposals imminent in the vicinity of the TMPP. However, the regional area will likely continue to experience development with or without this project. Consequently, traffic volumes on State Routes 89 and 299 will likely increase. The TMPP's level of traffic generation will diminish between the construction and operational phases such that an increase in background traffic should not be problematic. (Ex. 56, p. 120.)

4. Mitigation

Applicant has indicated its agreement and intention to comply with all LORS relating to the transport of oversized loads and the transport of hazardous materials and all Conditions of Certification contained herein. (Ex. 56, p. 121.) The applicant will: 1) prepare a construction traffic control plan and implementation program, and 2) design and construct a northbound left turn lane on State Route 299 at Energy Drive. In addition, the applicant is committed to repairing roadways to original condition after construction is completed. The applicant will also manage the on-site construction-period parking. These measures are incorporated into the conditions of certification.

FINDINGS AND CONCLUSIONS

Construction and operation of the Three Mountain Power Project will cause increased traffic on roadways in the local and regional areas. Based on the uncontroverted evidence of record, the Commission makes the following Findings.

1. During the construction phase, increased roadway demand resulting from the daily movement of workers and materials will increase congestion, causing service levels to be worse than the standards established by local and regional authorities.
2. During the operational phase, increased roadway demand resulting from the daily movement of workers and materials will be minimal.

3. All transportation and handling of hazardous substances can be mitigated to insignificance by compliance with federal and state standards established to regulate the transportation of hazardous substances.
4. Construction activities have the potential to damage local roadways. The applicant will be required to repair damaged roadways to their original condition.
5. Construction workers will park on-site.
6. Because their construction requires trenching within public road rights-of-way, the underground natural gas and water supply lines will impact both roadway function and levels of service. However, these impacts are expected to be short-term and not result in significant traffic and transportation impacts. The applicant will prepare a traffic control plan, which is contained within the Conditions for Certification. In addition, all development will take place in compliance with California Department of Transportation and Shasta County limitations for encroachment into public rights-of-way.

The Commission therefore concludes that construction and operation of the project will not result in any significant, direct, indirect, or cumulative adverse impacts to the regional transportation system.

CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall comply with California Department of Transportation (Caltrans) and Shasta County limitation on vehicle sizes and weights. In addition, the project owner or their contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions.

Verification: The project owner shall submit copies of any oversize and overweight transportation permits received during that reporting period in the Monthly Compliance Report. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file until the start of commercial operation and for at least six months from the date of issuance.

TRANS-2 The project owner or their contractor shall comply with California Department of Transportation (Caltrans) and Shasta County limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

Verification: The project owner shall submit copies of any encroachment permits received during that reporting period in the Monthly Compliance Report. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months from the date of issuance.

TRANS-3 The project owner shall ensure that all federal and state regulations for the transport of hazardous materials are observed during both construction and operation of the facility.

Verification: The project owner shall include, in their Monthly or Annual Compliance Reports, copies of all permits and licenses acquired by the project owner and/or subcontractors concerning the transport of hazardous substances.

TRANS-4 Prior to the start of construction, the project owner shall install a northbound left-turn lane on State Route 299 at Energy Drive in accordance with Caltrans design standards. The project owner shall submit design plans for the left-turn lane to Shasta County and Caltrans for review and comment, and to the Energy Commission Compliance Project Manager (CPM) for approval.

Protocol: The project owner shall consult with Shasta County and Caltrans and submit an updated queuing analysis, to the satisfaction of Shasta County and Caltrans, identifying the needed length of the pocket, to Shasta County, Caltrans and the CPM.

Verification: At least 15 days prior to start of construction of the TMPP, the project owner shall inform Shasta County, Caltrans and the CPM that the northbound left-turn lane is ready for inspection.

TRANS-5 Prior to the start of construction, the project owner shall consult with Shasta County and Caltrans and:

Prepare a construction traffic control plan and implementation program addressing the following issues:

- timing of heavy vehicle equipment and building materials deliveries;
- signing, lighting, and traffic control device placement;
- establishing construction work hours outside of the peak traffic periods;
- emergency access;
- temporary travel lane closures;
- maintaining access to adjacent residential and commercial properties; and
- off-street employee parking during construction.

Verification: At least thirty days prior to start of construction, the project owner shall provide to Shasta County and Caltrans for review and comment, and to the CPM for review and approval, a copy of their construction traffic control plan and implementation program.

TRANS-6 Following construction of the power plant and all related facilities, the project owner shall repair roadways to original or as near original condition as possible.

Protocol: Prior to start of construction, the project owner shall photograph State Route 299 from Energy Drive to Tamarack Road and sections of public roadways that will be affected by gas or water pipeline construction. The project owner shall provide the CPM, Shasta County and Caltrans with a copy of these photographs. Prior to start of construction, the project owner shall also notify Caltrans about the schedule for project construction. The purpose of this notification is to postpone any planned roadway resurfacing and/or improvement projects until after the TMPP construction has taken place and to coordinate construction related activities associated with other projects.

Verification: Within 30 days of the completion of project construction, the project owner will meet with the CPM, Shasta County and Caltrans to determine and receive approval for the actions necessary and a schedule to complete the repair of State Route 299 from Energy Drive to Tamarack Road and other identified sections of public roadways to original or as near original condition as possible.

TRANS-7 Prior to start of construction, the project owner shall prepare and submit a parking and staging plan for all phases of project construction to Shasta County for review and comment and to the CPM for approval. During construction of the power plant and all related facilities, the project owner shall manage the on-site construction-period parking.

Verification: At least sixty days prior to start of construction, the project owner shall submit the parking and staging plan to Shasta County for review and comment, and to the CPM for approval.

C. VISUAL RESOURCES

Visual resources are the natural and cultural features of the landscape that contribute to the visual character or quality of the environment. The California Environmental Quality Act (CEQA) requires an examination of a project's visual impacts on the environment which, in this case, would focus on the project's potential to cause substantial degradation to the existing visual character of the site and its surroundings. (Cal. Code of Regs., tit. 14, § 15382.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

Regional Setting. The project site lies about 50 miles northeast of Redding in the Burney Valley. The landscape includes Burney Mountain and views of peaks such as Mt. Shasta and Mt. Lassen that reach over 7,000 feet in elevation. The Burney Valley extends over three miles in length and the valley is enclosed on the west by a series of bluffs and mountain peaks. Lookout Mountain is the closest of the peaks to the project site, with an elevation of 4,520 feet. Burney Mountain lies approximately 5 miles south of the project site at an elevation of 3,173 feet above sea level. Dense stands of mixed conifer trees are seen on the mountain slopes with the National Forest Service timberline surrounding much of the valley. Communities in the project area include the unincorporated town of Burney with approximately 3,500 residents and Johnson Park, a community of approximately 500 residents, located approximately one-half mile northeast of the proposed power plant. In addition, small rural communities such as the several dozen homes on Vedder Road and Black Ranch Road are approximately one mile northwest of the power plant site. A scenic vista is located on State Route 299, approximately four miles southwest of Burney. From this vista point, panoramic views of Burney Valley can be seen to the east from an elevation of about 4,000 feet. Views of the valley are partially framed by conifer trees in the foreground and by the ridgelines and mountains in the distance. (Ex. 61, p. 7.)

Project Area Setting.

The project site will be located on a triangular 40-acre parcel surrounded by dense conifer trees. In addition to the proposed power plant facility, the property also includes a biomass power plant, a loading facility, a maintenance facility, a 125-foot exhaust stack, cooling towers and a three-story administration building. The proposed site is set back about 500 feet from State Route 299. The plant will be developed in an area that was occupied by wood chips for the biomass plant. The only vegetation in the area of the project site consists of low-growing annual grasses. (Ex. 61, pp. 7-8.)

White vapor plumes (water vapor condensation from the exhaust) will be visible from the project stacks and cooling tower. The height of the proposed cooling tower is 57 feet. The Staff analysis, before the adoption of wet/dry cooling (discussed below), indicated that, because of the existing tree screening, plumes less than 20 meters would barely be noticeable. Without dry or wet/dry cooling, the predicted height of the plume above the cooling towers would be greater than 20 meters for approximately 90 percent of the time. Without dry or wet/dry cooling, the plume height would be greater than 80 meters 23 percent of the time, and greater than 1,000 meters for 9 percent of the time. (Ex. 61, p. 14.)

Without dry or wet/dry cooling, the predicted plume lengths would be greater than 30 meters 88 percent of the time, greater than 40 meters 40 percent of the time, greater than 400 meters 18 percent of the time, and greater than 10,000 meters 3 percent of the time. In all instances, plume height and length would be dependent upon meteorological conditions. High relative humidity, stable atmospheric stratification and cool temperatures foster a long condensed plume. Without dry or wet/dry cooling, these conditions might produce long visible plumes during the hours near sunrise and sunset, but they generally occur during the night when a condensed plume would not be visible. (Ex. 51, p. 15.)

On August 22, 2000, TMPP submitted a document titled “Detailed Mitigation Plan and Analysis of Impact Assessments In Resource Areas Affected By the Mitigation Plan”. The Plan will employ a hybrid wet/dry condensing system, which consists of a water-cooled system and an air-cooled system in parallel. Staff analyzed and evaluated the effects of the wet/dry condensing system and its impact in the area of visual resources. (Ex. 64, Errata to the Testimony of David Flores.) As provided in the Mitigation Plan, the installation of a wet/dry condensing system will reduce the operation of the wet cooling tower. During conditions of colder ambient temperatures (less than 48°F) the wet cooling tower fans would not typically operate. The fans would start operating one at a time at ambient temperatures from 48° F to 73° F. The reduced operation of the wet cooling tower fans should reduce the frequency of occurrence of visible plumes. Due to the less frequent visible plumes from the implementation of the wet/dry condensing system, TMPP provided a revised SACTI model analysis to evaluate the cooling tower plume visibility. Staff reviewed the information provided and determined that the impact will remain less than significant. (*Ibid.*) Applicant’s expert, Ms. Gale, noted that the typical size of the plume during the summer will be about the same as with wet cooling only, but longer and larger plumes will occur less frequently. (12/18 RT 117.)

1. Methodology

Applicant and Staff conducted visual field studies that viewed the project landscapes from public roads and vantagepoints to develop an overall assessment of landscape characteristics and the potential for project impacts. Applicant chose three Key Observation Points (KOPs) to represent particularly sensitive viewpoints and for the purpose of development of photo simulations that could be used as a basis for visualizing the plant’s potential effects. (Ex. 61, p. 8.) The KOPs are:

- KOP 1. This represents the view toward the site from the access road (Energy Drive) into the project site. Although the public will not see this

view, the KOP was selected because it provides an unobstructed foreground view of the proposed power plant as it will appear at the site.

- KOP 2. This represents the view of the new transmission lines on the west side of the existing railroad tracks. Up to five years ago train activity included agricultural deliveries. Presently there are no sensitive receptors, given the sporadic nature of the rail line in this area, and therefore visual impacts would not be significant.
- KOP 3. This represents an open meadow/pasture area and a residential area approximately one mile northwest of the project site. Several dozen homes are within this rural residential area, with most homes situated within the forested areas. Approximately six to ten homes lie at the edge of the trees along the open pasture area. Views of this area encompass open meadow in the foreground against a backdrop of forest in the middleground and mountains in the background. The existing biomass power plant and the proposed TMPP lie beyond the stand of conifer trees at the edge of the meadow. (Ex. 61, p. 8, as modified by 3/21 RT 231-233.)

Panoramic photographs were taken of viewpoints KOP 1 through KOP 3 to document their existing visual features. Photosimulations of the viewpoints were prepared to show project features superimposed on the original photographs. (Ex. 1, Figures 6.6-6a through 6.6-8b; Ex. 61, Appendix A, Figures 2 through 4a.)

2. Visual Impacts

KOP 1 – Power Plant. From a visibility standpoint, with the dense cover of conifer trees and the distance of TMPP from the state highway, the project will not be visible to the traveling public, and visibility will be low. Viewer sensitivity, visual quality and view exposures are also determined to be low. From the perspective of form, line, color, texture, scale dominance, and spatial dominance,

because of its location, and general consistency with the existing biomass facility adjacent to the site, the project will not appreciably change the character and quality of the landscape visible from the access road. Considering all these factors, the visual impact would be less than significant from the view area represented by KOP 1. (Ex. 61, pp. 11-12.)

KOP 2 – Railroad Corridor. From this KOP, there are no sensitive receptors with the sporadic nature of the rail line in this area. Therefore visual impacts would not be significant. (Ex. 61, p. 12.)

KOP 3 – Open Meadow/Vedder Road Residential Area. Because of the residences in the area of KOP 3, viewer sensitivity is high. Nevertheless, Staff concluded that the proposed power plant and stacks will not have a significant impact based on the following summary of visual factors for KOP 3:

- viewer sensitivity is high;
- visual quality in this area is moderate to high;
- visibility is low to moderate;
- viewer exposure is low to moderate;
- the highest levels of contrast would be moderate;
- scale dominance would be subordinate;
- spatial dominance would be co-dominant; and
- view blockage would be minimal. (Ex. 61, pp. 12-14.)

The construction and operation of the project, including the transmission lines and gas pipeline, would not result in significant adverse visual impacts. The power plant is sufficiently far from residences that visual impacts due to construction would not be significant. (Ex. 61, p. 11.)

Based on its independent review of the Applicant's plume modeling, Staff concluded that the visible cooling tower plume will not cause significant adverse visual impacts even before the adoption of wet/dry cooling. This was based, in

part, on the small number of viewers within the Vedder Road residential area. Frequency, persistence, and the size of the visible condensate plume will be dependent on meteorological conditions of wind, temperature and humidity. For the public traveling along State Highway 299, the view of the Burney Valley at the scenic pullout (approximately six miles from the project site) would be of relatively small scale, therefore visibility would be low to moderate. For the residences along Vedder Road with direct views of the plant site, the visibility of the plume is moderate partly because the front view from the homes faces away from the plant site. In addition, the trees along the perimeter of the residential area provide a partial screen of the plume in some instances. (Ex. 61, pp. 15-16.) As noted above, after this analysis, TMPP submitted a mitigation plan that employed a hybrid wet/dry condensing system, which consists of a water-cooled system and an air-cooled system in parallel. This modified system would reduce the operation of the wet cooling tower, and reduce the frequency of occurrence of visible plumes. (Ex. 64, Errata to the Testimony of David Flores.)

Staff concluded, assuming effective implementation of applicant's proposed mitigation measures, as modified, expanded, and augmented by Staff's recommendations, the project is not expected to cause any significant visual impacts. We agree. With the proposed mitigation, the project is also expected to be in compliance with applicable laws, ordinances, regulations, and standards regarding visual resources. (Ex. 61, pp. 22-24.) No changes to Staff's proposed Conditions of Certification are necessary as a result of the wet/dry cooling amendment. (Ex. 62; Ex. 64, Errata to the Testimony of David Flores.)

3. Mitigation

Applicant proposed eight mitigation measures to be incorporated into the project design to minimize visual impacts associated with the operation of the facility. Staff generally agreed with Applicant's proposals in regard to color and lighting for the power plant. The Applicant's measures were more precisely developed in

Conditions of Certification proposed by Staff and accepted by Applicant. (Ex. 14, Testimony of Marsha Gale, p. 7; Ex. 61, pp. 21-22.) We adopt them.

FINDINGS AND CONCLUSIONS

Based on the evidence of record, the Commission makes the following Findings and Conclusions:

1. The Three Mountain Power Project (TMPP) is located in a rural area, which is characterized by panoramic views of the Burney Valley, Lookout Mountain, Burney Mountain, and more distant views of Mt. Shasta and Mt. Lassen.
2. The nearest sensitive viewing areas are located approximately one mile northwest of TMPP, consisting of several homes on Vedder Road and Black Ranch Road. A scenic vista is located on State Route 299, approximately four miles southwest of Burney.
3. Project facilities that could result in significant visual impacts include the cooling towers, heat recovery system generator (HRSG) exhaust stacks, and the transmission line.
4. Views of project facilities are too transitory or too distant to result in significant visual impacts, except for the view from some of the Vedder Road residences. For those residences, there is no significant impact considering all the evidence.
5. Plumes from the cooling towers and HRSG stacks will not result in significant visual impacts to the panoramic landscape.
6. The proposed power plant would be larger than the existing biomass facility, so the incremental increase in impact would be noticeable. However, the visual impact would not be substantial because almost all of the proposed plant would be screened from view by trees. Mitigation measures address other potential cumulative visual impacts occasioned by the addition of TMPP to the viewshed.

The Commission concludes that the implementation of the mitigation measures contained in the Conditions of Certification and otherwise described in the record of evidence will ensure that neither the power plant nor its overhead transmission line will cause significant adverse impacts to visual resources. Implementation of

the Conditions of Certification, below, will insure that TMPP complies with all applicable laws, ordinances, regulations, and standards relating to visual resources as identified in the pertinent portions of APPENDIX A of this Decision.

CONDITIONS OF CERTIFICATION

VIS-1 Prior to the start of commercial operation, the project owner shall treat the project structures, buildings, towers, substation and tanks visible to the public in a non-reflective color to blend with the surroundings. The project owner shall treat the cooling towers with a heat-resistant color that minimizes contrast and harmonizes with the surrounding environment.

Protocol: The project owner shall submit a treatment plan for the project to the California Energy Commission Compliance Project Manager (CPM) for review and approval. The treatment plan shall include:

- Specification, and 11" x 17" color simulations, of the treatment proposed for use on project structures, including structures treated during manufacture;
- a detailed schedule for completion of the treatment; and,
- a procedure to ensure proper treatment maintenance for the life of the project.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall submit to the CPM a revised plan.

After approval of the plan by the CPM, the project owner shall implement the plan according to the schedule and shall ensure that the treatment is properly maintained for the life of the project.

For any structures that are treated during manufacture, the project owner shall not specify the treatment of such structures to the vendors until the project owner receives notification of approval of the treatment plan by the CPM.

The project owner shall not perform the final treatment on any structures until the project owner receives notification of approval of the treatment plan from the CPM.

The project owner shall notify the CPM within one week after all precolored structures have been erected and all structures to be treated in the field have been treated and the structures are ready for inspection.

Verification: No later than 30 days prior to ordering the first structures that are color treated during manufacture, the project owner shall submit its proposed plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

Not less than 30 days prior to the start of commercial operation, the project owner shall notify the CPM that all structures treated during manufacture and all structures treated in the field are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-2 All fencing for the project shall be non-reflective.

Protocol: Prior to ordering the fencing the project owner shall submit to the CPM for review and approval the specifications for the fencing documenting that such fencing will be non-reflective.

If the CPM notifies the project owner that revisions of the specifications are needed before the CPM will approve the submittal, the project owner shall submit to the CPM revised specifications.

The project owner shall not order the fencing until the project owner receives approval of the fencing submittal from the CPM.

The project owner shall notify the CPM within one week after the fencing has been installed and is ready for inspection.

Verification: At least 30 days prior to ordering the non-reflective fencing, the project owner shall submit the specifications to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the fencing that the fencing is ready for inspection.

VIS-3 Prior to the start of commercial operation, the project owner shall design and install all lighting such that light bulbs and reflectors are not visible from public viewing areas and illumination of the vicinity and the nighttime sky is minimized. To meet these requirements:

Protocol: The project owner shall develop and submit a lighting plan for the project to the CPM for review and approval. The lighting plan shall require that:

- Lighting is designed so that exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of this outdoor lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;
- High illumination areas not occupied on a continuous basis such as maintenance platforms or the main entrance are provided with switches or motion detectors to light the area only when occupied;
- A lighting complaint resolution form (following the general format of that in Attachment 1) will be used by plant operations, to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file and a carbon copy submitted to the CPM.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

Lighting shall not be installed before the plan is approved. The project owner shall notify the CPM when the lighting has been installed and is ready for inspection.

Verification: At least 90 days before ordering the exterior lighting, the project owner shall provide the lighting plan to the CPM for review and approval. The CPM will notify the project owner of approval or disapproval within 15 days of receipt of the lighting plan.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days of completing exterior lighting installation that the lighting is ready for inspection.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

VIS-4 Prior to the start of commercial operation, to offset the contribution of the Three Mountain Power Plant to project cumulative lighting impacts, the project owner shall have the lighting at the biomass plant modified such that light bulbs

and reflectors are not visible from public viewing areas and illumination of the vicinity and the nighttime sky is minimized. To meet these requirements:

Protocol: The project owner shall develop and submit a lighting plan for the project to the CPM for review and approval. The lighting plan shall require that:

- Exterior lighting fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The luminescence or light source is shielded to prevent light trespass outside the project boundary;
- High illumination areas not occupied on a continuous basis such as maintenance platforms or the main entrance are provided with switches or motion detectors to light the area only when occupied;
- A lighting complaint resolution form (following the general format of that in Attachment 1) will be used by plant operations, to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file and a carbon copy submitted to the CPM.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

Lighting shall not be installed before the plan is approved. The project owner shall notify the CPM when the lighting has been installed and is ready for inspection.

Verification: At least 90 days before ordering the exterior lighting, the project owner shall provide the lighting plan to the CPM for review and approval. The CPM will notify the project owner of approval or disapproval within 15 days of receipt of the lighting plan.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days of completing exterior lighting installation that the lighting plan is ready for inspection.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

VIS-5 Prior to the start of commercial operation, the project owner shall implement a landscape plan that meets the requirements of the Shasta County Planning Department and provides a continuous screen of the proposed power plant.

- a. The project owner shall submit to the Shasta County Planning Department for review and comment and to the CPM for review and approval a specific plan describing its landscaping proposal, stating that it conforms to Shasta County Planning Department's requirements. The plan shall include, but not be limited to:
 - a detailed landscape plan, at a reasonable scale, which includes a list of proposed tree and shrub species and sizes and a discussion of the suitability of the plants for the site conditions and mitigation objectives;
 - maintenance procedures, including any needed irrigation;
 - a procedure for replacing unsuccessful plantings; and
 - a fifty-foot vegetative visual buffer area on-site and adjacent to the property boundaries, excluding the northern property boundary which is adjacent to land located in the Timber Production (TP) district. Trees common to the area shall be planted, as necessary and existing trees within the 50-foot area shall be a minimum of 15-inch box in size. The intent of the buffer is to create a screen of vegetation to reduce visual impact from adjoining properties and roads.
- b. If the CPM notifies the project owner that plan revisions are needed, the project owner shall prepare and submit to the CPM a revised plan for CPM approval.
- c. The trees and shrubs shall not be planted before the plan is approved. The project owner shall notify the CPM when the trees and shrubs have been planted and are ready for inspection.

Verification: At least 90 days prior to the start of commercial operation, the project owner shall submit the proposed landscape plan to the Shasta County Planning Department for review and comment, and to the CPM for review and approval. The CPM will respond to the project owner within 15 days of receipt of the landscaping plan.

The project owner shall submit any required revision within 15 days of notification by the CPM. The CPM will respond to the project owner within 15 days of receipt of the revised documents. The project owner shall notify the CPM in the next

Monthly Compliance Report following completion of the proposed planting that the planting is ready for inspection.

VIS-6 The project owner shall comply with the requirements of the County of Shasta Conditions of Approval regarding screening of outdoor storage and refuse storage areas.

The project owner shall submit a plan for screening refuse and storage areas to the CPM for review and approval. The submittal shall include evidence from the County of Shasta that the plan conforms to the conditions of approval requirements submitted to commission staff on October 6, 1999.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, the project owner shall submit to the CPM a revised plan.

The project owner shall not implement the construction of the storage areas until the project owner receives approval of the submittal from the CPM.

The project owner shall notify the CPM within one week after the screening has been installed and is ready for inspection.

Verification: At least 30 days prior to installing the screening, the project owner shall submit the plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the screening that the screening is ready for inspection.

VIS-7 Prior to the start of commercial operation, the project owner shall design and submit to CPM for review and approval a signage plan including specifications for the new signage identifying TMPP. The project owner shall not install the TMPP sign(s) until the signage plan has been approved by the CPM.

Protocol: The signage plan shall include the following design criteria which meets Shasta County Zoning requirements:

- Signage for purposes of site identification shall be limited to one monument sign;

- The monument sign shall not exceed six feet in height and not exceed 90 square feet in size. For a double faced monument, each face shall not exceed 45 square feet;
- The sign shall be set back a minimum of 12 feet from the front or street side property line and shall be located within a landscape island equal to a minimum of one-half the total sign area of the free standing sign.

If the sign is lighted, it shall have indirect illumination in which the light source is from within the cabinet or is from an outside fixture that distributes the light evenly on the sign.

If the CPM notifies the project owner that revisions of the signage plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

Verification: At least 120 days prior to the start of commercial operation, the project owner shall submit the TMPP signage plan to the CPM for review and approval. The project owner shall notify the CPM that the installed sign(s) is/are ready for inspection within 30 days of completion and installation.

D. NOISE

The construction and operation of any power plant project will create noise. The character and loudness of this noise, the times of day or night during which it is produced, and the proximity of the project to sensitive receptors combine to determine whether project noise will cause significant adverse impacts to the environment. In this section, the Commission evaluates whether noise produced by project-related activities will be sufficiently mitigated to comply with applicable noise control laws and ordinances.

SUMMARY AND DISCUSSION OF THE EVIDENCE

Laws that regulate noise disturbances in the project vicinity are included in the laws, ordinances, regulations and standards (LORS) impacting Shasta County. The significant LORS is the Noise Element of the Shasta County General Plan. This Noise Element limits the noise from a new stationary source to no more than 50 dBA L_{eq} measured 100 feet from the nearest sensitive receptor during nighttime hours. Facility-related noise levels near residential receptors must not exceed 50 dBA (Hourly L_{eq}) between the hours of 10:00 p.m. to 7:00 a.m. and 55 dBA (Hourly L_{eq}) between the hours of 7:00 a.m. to 10:00 p.m.

Power generating activities within the proposed project area would be subject to a maximum 70-dBA CNEL⁷² impact threshold level (i.e., the maximum level they could produce before requiring mitigation) or 75-dBA CNEL level with appropriate mitigation. Mitigation in the form of equipment enclosure will be employed to reduce property line noise exposure to levels that meet Shasta County's "conditionally acceptable" property line CNEL of 75 dBA. There are no applicable construction noise regulations identified in the Noise Element. The administering agency for the above authority is the Shasta County Department of Planning and Development Services. (Ex. 64, p. 87, 96.)

⁷² Community Noise Equivalent Level

1. Setting

The project site for the Three Mountain Power Project (TMPP) is located directly west of State Route 299, approximately one-mile northeast of Burney and one-half mile southwest of Johnson Park in Shasta County, California. TMPP is bounded by forested open space to the north and south, open space and State Route 299 to the east, and the McCloud River Railway to the west. The site is generally level, approximately 3,140 feet above mean sea level. The nearest sensitive receptor is a single-family residence (the Hathaway residence) located approximately 1,400 feet due west of the property boundary, on Black Ranch Road. Several residences in the southern limits of Johnson Park are located approximately 1,800 feet northwest of the property boundary. The nearest schools to the site include an elementary and junior/senior high school in the town of Burney. These schools are located approximately 1.5 miles south of the property. The majority of the lands surrounding the site consist of natural open space. Direct access to the site is provided via State Route 299. There are sensitive receptors (schools, residences and places of worship) within a 2-mile radius of the power plant site. This is an area inside which construction and operation of a power plant project is likely to cause noise impacts. Since sensitive receptors are within a 2-mile radius, mitigation measures are required to minimize noise impacts to these sensitive receptors. (Ex. 64, p. 87.)

2. Ambient Noise Levels, Potential Impacts and Mitigation

Applicant conducted surveys of the ambient noise levels adjacent to the site and two surveys near the sensitive residential receptors. Applicant's original study⁷³ was published in February 1999 and was the basis of the Noise section of the AFC. (Exhibit 1, § 6.4.) Field measurements were made at the Hathaway residence in November 1998. They indicate that the background (L_{90}) noise level

at this residence was 42.8 dBA.⁷⁴ (Ex. 64, pp. 88-89.) The Applicant's second study⁷⁵ was prepared in November 2000. These measurements, performed in July 2000, were taken 100 feet from the centerline of Black Ranch Road, on the opposite side of the residence from the proposed power plant. (Ex. 66, Testimony of J. D. Fuller, § II. A.) Mr. Fuller found that the "average hourly sound level ranged from approximately 51 dBA $L_{eq}(h)$ to 59 dBA $L_{eq}(h)$." (*Ibid.*) We reject that finding. Staff also had reservations about that measurement and, therefore, hired its own expert, Brown-Buntin Associates, Inc. (BBA) to measure ambient noise levels. (Ex. 67, Supplemental Testimony of Steve Baker, pp. 2-3.) BBA measured ambient noise levels at a location 100 feet from the Hathaway residence, on the east side of the residence (the side toward the power plant), for a period of 37 hours.⁷⁶ The results of this measurement are presented in BBA's report (Attachment 1 to Ex. 67, Supplemental Testimony of Steve Baker.) BBA results indicate that background (L_{90}) noise levels at the Hathaway residence range as low as the mid-30s, and the 24-hour average is from 41 to 42 dBA. We adopt this finding. This finding corresponds closely with the 42.8 dBA average L_{90} reported in the original (pre-wet/dry cooling) analysis by Applicant. (Ex. 67, Supplemental Testimony of Steve Baker, p. 3.)

All parties agree that the noise level at the Hathaway residence is heavily influenced by traffic on Black Ranch Road and Highway 299. (See, e.g., Ex. 1, § 6.4.2.2, Ex. 66, § II. A. and Attachments, and the BBA report.) Where traffic noise dominates, it is customary to examine not the single lowest background (L_{90}) level, but the **average** background level throughout the nighttime hours. Staff took this approach in its analysis. (Ex. 67, Supplemental Testimony of Steve Baker, p. 1.) Importantly, in this case, ambient noise level at the nearest sensitive receptor is actually lower during the day than at night. The BBA noise survey shows an average nighttime background noise levels around 43 dBA (Ex.

⁷³ This study is attached as Exhibit 2 to Exhibit 66, Testimony of J. D. Fuller.

⁷⁴ Measurements were taken in the "front yard area."

⁷⁵ This study is incorporated as Exhibit 3 to Exhibit 66, Testimony of J. D. Fuller.

⁷⁶ Additionally, BBA measured noise levels on the existing power plant site, including at a point in the southeast corner, from which the applicant had measured noise levels for the AFC, but the results were inconclusive.

67, Supplemental Testimony of Steve Baker, p. 3) and we adopt that finding as well.

a. Construction

Construction of the power plant and associated linear facilities will cause short-term noise impacts. Site clearing and preparation will require the use of heavy diesel-powered earthmoving equipment. Foundation construction will primarily involve concrete handling equipment and some earthmoving equipment for backfill. The building and equipment installation will involve mobile cranes, equipment delivery, impact wrenches, and air compressors. Site cleanup and facility startup would generally result in minimal noise emissions. (Ex. 1, § 6.4.2.4; Ex. 64, pp. 89-92.) Noisy construction work is restricted to the hours delineated in Condition **NOISE-7**. The Commission notes however, the need to expedite the construction of power plants to address the current problem of insufficient electrical generating capacity. Therefore, if the Applicant believes the current Conditions of Certification will adversely delay the construction of the TMPP, the Applicant is directed to consult with Commission Staff to identify ways to expedite construction while trying to minimize noise impacts to the local residents. The Commission is currently working on procedures to help expedite the construction of power plants.

Construction of the gas line will also produce noise. The natural gas tie-in line and water pipeline will be installed concurrent with the construction of foundations. Construction of these pipelines will involve trenching and installation of the line. (Ex. 64, p. 91.)

Noise associated with construction of the electrical transmission tie-in line will be lower than noise associated with construction of the facility, as less equipment will be used. Reconductoring of the PG&E transmission lines will result in minimal noise levels. It will be short term in any one location and will involve no more equipment than routine line maintenance. One or two locations may be

inaccessible by standard access roads, and helicopters may be used in these places. Because of the remoteness and inaccessibility of these locations, and the absence of sensitive noise receptors, no noise impacts are expected. (Ex. 64, p. 92.)

Conditions **NOISE-1** and **NOISE-3** require the project owner to notify all residents and business owners in the vicinity of planned construction activities and to establish a noise complaint resolution process.

The loudest construction noise is created by steam blows, which are necessary to flush piping and tubing of accumulated debris prior to start-up. However, the Applicant has confirmed to the Commission that it will use a new, quieter steam blow technology that uses lower steam pressure over a longer period. (Ex. 64, p. 92). This quieter steam blow technology complies with the noise standards in the Shasta County General Plan (*Id.*). In addition, Condition **NOISE-1** requires notification of neighbors prior to initiating the steam blow process.

Project workers are susceptible to injury from excessive noise during construction-related activities. Some workers will occasionally be exposed to noise levels above 85 dBA during construction. The applicant predicts that construction noise levels will not reach levels that require worker protection, but will put in place engineering controls, administrative controls, and hearing protection devices. **NOISE-4** requires the project owner to implement a noise control program for construction workers in accordance with Cal/OSHA standards. (Ex. 64, p. 93.)

b. Operation

The primary noise sources at the TMPP include: two combustion turbine generators (CTGs) and associated CTG air inlets, two heat recovery steam generators (HRSGs), one steam turbine generator (STG), wet cooling tower fans, air-cooled condenser fans, transformer areas, feed pumps and ancillary

switchgear. (Ex. 64, FSA p. 93.) TMPP was originally configured to employ an evaporative (wet) cooling tower system. The applicant subsequently filed a Detailed Mitigation Plan that proposed to utilize instead a hybrid wet-dry cooling system. This added numerous electric motor-driven fans to the project, thus potentially increasing project noise impacts. (Ex. 67, Baker Testimony, p. 1.) After deciding to incorporate a hybrid wet-dry cooling system, the applicant commissioned a new ambient noise survey, as noted above.

The only sensitive receptor that would be impacted by an increase of more than 5 dBA is the Hathaway residence. (12/18 RT 71.)

If the project produces (worst case) noise levels at the Hathaway residence (the nearest sensitive receptor) of 50 dBA L_{eq} , as asserted in the Detailed Mitigation Plan and Mr. Fuller's testimony (12/18 RT 50), the resulting noise level would be 43 dBA plus 50 dBA, or 51 dBA. (See Ex. 64, Appendix A, NOISE Table A3, p. 108.) This is an increase over background noise levels of 8 dBA, representing a significant adverse environmental impact. If the project noise, after mitigation by suppression efforts at the source, is only 48 dBA at the receptor, the resulting noise level would be 43 dBA plus 48 dBA, or 49 dBA. This is an increase of 6 dBA, that may or may not be a potentially significant adverse impact in light of the fact that the noise is heavily influenced by traffic. (Ex. 67, Supplemental Testimony of Steve Baker, p. 3.) In any event, the conditions we impose will reduce this impact to less than significant.

Mitigation in the form of equipment enclosure will be employed to reduce property line noise exposure to levels that meet Shasta County's "conditionally acceptable" property line CNEL of 75 dBA. (Ex. 64, p. 96.) Conditions have been proposed in an attempt to meet Shasta County requirements. (See the alternate proposals for Condition **NOISE-4** in Ex. 67, Supplemental Testimony of Steve Baker, pp. 4-6.) We have, however, revised and renumbered the conditions herein. Specifically, we have added a new Condition **NOISE-2**, to provide for mitigation at the Hathaway residence itself, as suggested by Staff.

(Ex. 67, Supplemental Testimony of Steve Baker, p. 5.) We have also revised renumbered condition **NOISE-5** to require multiple noise surveys during the first year of operation to gather accurate information when the various cooling configurations are employed, with an accompanying requirement of further mitigation if needed. In addition, we add one year to the call-in period for noise complaints in Condition **NOISE-1**.

The evidence establishes that there are no noise impacts associated with operation of the linear facilities. The gas tie-in line and water pipelines will be buried below ground. The noise from the high voltage transmission line is generally inaudible at distances greater than 50 feet from the conductor bundle except during rainy or high humidity conditions. The noise from the switchyard will generally be inaudible at the switchyard property line. (Ex. 64, p. 95.)

Staff reviewed the potential for cumulative impacts related to new or existing projects. There are no projects within the TMPP Area of Influence. As a result, there are no significant cumulative effects associated with construction of TMPP. (Ex. 64, p. 97.)

FINDINGS AND CONCLUSIONS

Based on the evidence of record, the Commission makes the following Findings:

1. Construction and operation of the Three Mountain Power Project (TMPP) will create noise.
2. Construction noise levels are temporary and transitory in nature and will be mitigated to the extent feasible by sound reduction devices, limiting construction to daytime hours, and providing notice to nearby businesses and residences, as appropriate.
3. Construction noise along either natural gas or water pipeline routes will be temporary and will not result in significant adverse noise impacts.
4. The nearest sensitive residential receptor potentially affected by operational noise is located about 1,400 feet from the project site.

5. Operational noise from the power plant will increase the existing ambient noise levels experienced at the nearest sensitive receptor. However, the resulting noise level, after mitigation, will be in compliance with the applicable laws, ordinances, regulations, and standards, including the Shasta County Noise Element.
6. The project owner will implement measures to protect workers from injury due to excessive noise levels.

The Commission therefore concludes that the mitigation measures described in the evidentiary record and the Conditions of Certification, below, ensure that project-related noise levels will not cause significant adverse impacts to sensitive noise receptors. Implementation of the measures contained in the Conditions of Certification, below, ensures that TMPP will comply with the applicable laws, ordinances, regulations, and standards specified in the pertinent portion of Appendix A of this Decision, and that noise impacts will be mitigated to the extent feasible.

CONDITIONS OF CERTIFICATION

NOISE-1 At least 15 days prior to the start of construction (defined as start of rough grading) of the TMPP and again at least 15 days prior to the commencement of steam blow activity, the project owner shall notify all residents within a 2-mile radius of the project site, by mail or other effective means. The project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the TMPP. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall also be posted at the TMPP site during construction in a manner visible to passersby. This telephone number shall be maintained until the TMPP has been operational for at least two years.

Verification: The project owner shall transmit to the Compliance Project Manager (CPM) in the first monthly construction report following the start of rough grading, a statement signed by the project manager attesting that the above notification has been performed, describing the method of that notification, and including a sample letter, poster or other notice, as appropriate. This statement shall also attest that the telephone number has been established and posted at the power plant site.

NOISE-2 Prior to the start of operation, the project owner shall install ceiling and wall insulation, multi-pane windows and an air conditioning system to the

Hathaway residence (unless the owners of the Hathaway residence object to such installation, in which case the Applicant's demonstration to the satisfaction of the CPM that the Applicant has offered appropriate mitigation shall satisfy this condition).

Verification: In the first annual compliance report after start of operation the project owner shall include documentation certifying that mitigation has been applied to the Hathaway residence (either by installation of wall and ceiling insulation, multiple-pane windows and an air conditioning system, or by demonstration to the CPM that such installation was offered but refused by the owner of the Hathaway residence).

NOISE-3 Throughout the construction and operation of the TMPP, the project owner shall document, investigate, evaluate, and attempt to resolve all project related noise complaints.

Protocol: The project owner shall:

1. use the Noise Complaint Resolution Form (see below for an example), or functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
2. attempt to contact the person(s) making the noise complaint within 24 hours;
3. conduct an investigation to determine the source of noise related to the complaint;
4. take all feasible measures to reduce the noise at its source if the noise is project related, and
5. submit a report documenting the complaint and the actions taken. The report shall include a complaint summary and the results of noise reduction efforts; and if obtainable, a signed statement by the complainant, stating that the noise problem is resolved to complainant's satisfaction.
6. Within 30 days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with Shasta County and with the CPM documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 30-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is finally implemented.

NOISE-4 Prior to the start of construction of TMPP, the project owner shall submit to the CPM for review a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA standards.

Verification: At least 30 days prior to the start of rough grading the project owner shall submit to the CPM the above referenced program. The project owner shall make the program available to OSHA upon request.

NOISE-5 In order to monitor noise from the project when the cooling tower is operating in the dry, wet/dry and wet modes of operation, project owner shall conduct three 25-hour community noise surveys: 1) when the cooling tower is operating the full wet mode, 2) when the cooling tower is operating in the full dry mode, and 3) when cooling tower is operating in the wet/dry (e.g., approximately 50/50) mode. The surveys shall begin once the TMPP has achieved an output of 80 percent or greater of rated capacity. The survey will be conducted utilizing the same monitoring sites employed in the pre-project ambient noise survey as a minimum. The survey shall be performed when the Burney Mountain Power Plant is also operating at or near full load, and shall also include the octave band pressure levels to ensure that no new pure-tone noise components have been introduced. No single piece of equipment shall be allowed to stand out as a dominant source of noise that draws complaints. Steam relief valves shall be adequately muffled to preclude noise that draws complaints. The noise contributed by the TMPP operation at 100 feet from the nearest residence shall not exceed 50 dBA L_{eq} (night) under normal operating conditions including startups and shutdowns. If the results from any of the surveys indicate that power plant noise levels are in excess of 50 dBA L_{eq} (night) at 100 feet from the nearest residence, additional mitigation measures shall be implemented to reduce noise to a level of compliance with this limit. The mitigation measures (to be employed as required) may include, but not be limited to, providing air inlet silencers for the combustion turbines.

Verification: Within 30 days after completing each survey, the project owner shall submit a summary report of the survey to Shasta County and the CPM. Included in each report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. If installation of any additional measures is required, the project owner shall conduct additional noise surveys under the same operating mode (e.g., wet, dry or wet/dry) to verify compliance. The project owner shall submit to the CPM a summary report of a new noise survey within 30 days of completing the survey.

NOISE-6 The project owner shall conduct occupational noise surveys to identify the noise hazardous areas in the facility. In order to monitor occupational noise from the project when the cooling tower is operating in the dry, wet/dry and wet modes of operation, the project owner shall conduct the occupational noise surveys to determine noise levels in all configurations of wet, dry and wet/dry modes of operation. The surveys shall be conducted within thirty (30) days after the facility is operating at an output of 80% of rated capacity or greater, and shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations sections 5095-5100 (Article 105) and Title 29, Code of Federal Regulations, Part 1910. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner shall

prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable state and federal regulations.

Verification: Within 30 days after completing each survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA upon request.

NOISE-7 Construction and construction related activity (that which causes off-site annoyance, as evidenced by the filing of a legitimate noise complaint) shall be restricted to the hours of: 7 a.m. to 7 p.m. on weekdays and from 8 a.m. to 6 p.m. on weekends and holidays.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement certifying that the above restrictions will be observed throughout the construction of the project.

NOISE COMPLAINT RESOLUTION FORM

Three Mountain Power Project (99-AFC-2)		
NOISE COMPLAINT LOG NUMBER _____		
Complainant's name and address:		
Phone number: _____		
Date complaint received: _____		
Time complaint received: _____		
Nature of noise complaint:		
Definition of problem after investigation by plant personnel:		
Date complainant first contacted: _____		
Initial noise levels at 3 feet from noise source _____	dBA	Date: _____
Initial noise levels at complainant's property: _____	dBA	Date: _____
Final noise levels at 3 feet from noise source: _____	dBA	Date: _____
Final noise levels at complainant's property: _____	dBA	Date: _____
Description of corrective measures taken:		
Complainant's signature: _____		Date: _____
Approximate installed cost of corrective measures: \$ _____		
Date installation completed: _____		
Date first letter sent to complainant: _____		(copy attached)
Date final letter sent to complainant: _____		(copy attached)
This information is certified to be correct:		
Plant Manager's Signature: _____		

(Attach additional pages and supporting documentation, as required).

E. SOCIOECONOMICS

The socioeconomic analysis evaluates the effects of project-related population changes on local schools, medical and protection services, public utilities, and other public resources, as well as the fiscal and physical capacities of local government to meet these needs. The construction phase of project development is typically the focus of the analysis because of the potential influx of workers into the area. Socioeconomic impacts are considered significant if a large influx of non-resident workers and dependents move to the project area, increasing demand for community resources that are not readily available.

SUMMARY AND DISCUSSION OF THE EVIDENCE

Three Mountain will be located about one mile northeast of the town of Burney in Shasta County.⁷⁷ (Ex. 1, § 6.7.1.1; Ex. 56, p. 251.) In part because of steady losses in the lumber and wood products industry over the past several years, economic growth in the Burney area has declined.⁷⁸ (Ex. 1, pp. 6.7.1.2 & Table 6.7-1; Ex.16, Testimony of Danielle Tinman. p. 1; Ex. 56, p. 253.) Thus, the proposed project would provide a new economic stimulus and a much-needed boost for the local economy. (*Id.*; 3/21 RT 85-86.)

The small town of Johnson Park is located approximately one mile north of Burney; the City of Redding is 45-miles southwest, and Fall River Mills is 20 miles northeast of Burney. (Ex. 56, pp. 251, 255.) The study or affected area for the project is Shasta County, but Applicant's research focused on the vicinity of the town of Burney. (Ex. 1, § 6.7.1.1.) Staff expects that Redding will provide a significant portion

⁷⁷ Burney's 1999 population is listed at 3,423. (Ex. 56, p. 252.) Situated near the junction of the Southern Cascade Range and the Modoc Plateau, Burney's basic industries rely on the forest, whether on its products or its recreational appeal. (Ex. 1, § 6.7.1.1.)

⁷⁸ Local businessmen have relayed to Staff that over two dozen shops and businesses have left downtown Burney in the last few years. (Ex. 56, p. 253; see Condition **SOCIO-1**.)

of the labor force and materials needed to construct the proposed project.⁷⁹ (Ex. 56, pp. 251-52.)

Three Mountain will have a temporary socioeconomic benefit to the town of Burney and Johnson Park. Specifically, the proposed project will provide an increased demand for services, and a few local jobs will be generated during construction. (Ex. 56, p. 252.) The construction payroll and project expenditures will also have a positive effect on the local and county economy. (*Ibid.*) Operation of the facility will involve:

- 20 to 25 full-time workers;
- the purchase of materials and supplies; and
- property tax revenues on an annual basis. (*Ibid.*)

Three Mountain will not adversely area services, such as schools, medical services, water and natural gas supply, law enforcement, or housing. (3/21 RT 86; Ex. 1, §§ 6.7.1.4-6.7.2.4; Ex. 56, pp. 252-255.) Staff identified a potential significant impact on fire protection services. (Ex. 56, p. 252.) This impact, however, has been mitigated to less than significant during a course of negotiations between Applicant and the Burney Fire District on funding for fire equipment and training. (3/21 RT 78-84; 92-95; see also Condition **SOCIO-2**.)

1. Construction Impacts

Altogether, the capital cost of the Three Mountain Power Project is estimated at \$250 million dollars.⁸⁰ (Ex. 1, § 6.7.2.1.) Construction activities will last for approximately

⁷⁹ Unlike Burney, Redding relies more on its role as a service provider for surrounding communities, farmlands, and Interstate 5 travelers. Burney depends on Redding as a source of goods and services, so changes in economic activity in the Burney area could ripple through the Redding economy as well. (Ex. 1, p. 6.7.1.1.)

⁸⁰ Almost all of the materials are expected to come from outside Shasta County, but an estimated \$2 million dollars worth of materials may be purchased within the county. (Ex. 1, p. 6.7.2.1.)

22 months on-site, with expected employment of more than 100 workers for 15 months, 200 workers for 10 months, and 300 workers for 4 months. (Ex. 1, pp. 6.7.2.1 & Figure 6.7-1.)

The labor force required for construction of the project includes boilermakers, carpenters, electricians, ironworkers, laborers, millwrights, operators, pipefitters and others. (Ex. 1, Table 6.7-7.) Staff believes that the Redding area can supply the largest component of the necessary laborers who will probably commute to the site daily during the 24 month construction period. (Ex. 56, p. 252.)

Employment will peak during the 13th month of construction when almost 350 workers will be needed. (Ex. 56, pp. 252, 259-260.) An average of 224 workers will be needed for fourteen consecutive months beginning in the 7th month of construction.⁸¹ (*Id.*) Payrolls over the construction period will total between \$23.8 and \$27.2 million dollars with about \$2.3 million paid out during the peak month of construction. (Ex. 1, p. 6.7.2.1.)

Assuming the assessed value of the power plant is \$250 million and the tax rate is one percent, about \$2.5 million of property tax revenue would be generated annually for Shasta County. (Ex. 16; Testimony of C. Michael Costanzo, p. 2, and Danielle Tinman, p. 2; Ex. 56, p. 55.) **Socioeconomics Table 1**, below, depicts the estimated distribution of the tax revenues generated by the proposed project.

⁸¹ PG&E personnel will do the transmission line reconductoring, which is scheduled to begin in the summer of 2000, to be completed by the fall of 2001. (Ex. 56, p. 252.) It is anticipated that two crews, a combined workforce of 10 to 18 people, will do the work. (*Ibid.*)

SOCIOECONOMICS Table 1
Estimated Distribution of Property Tax Revenue from Three Mountain Power Plant

PROPOSED OGDEN GAS-FIRED 500MW FACILITY IN BURNEY

IF: THE PROPOSED FACILITY IS IN TAX RATE AREA 0770-049, AND

Assessed Value	\$250,000,000
Tax Rate	<u>1.0</u>
Tax Revenue	\$2,500,000

IF: THE PROPOSED FACILITY IS LOCALLY ASSESSED, THEN:

THE ESTIMATED DISTRIBUTION OF TAX REVENUES GENERATED BY
 THE PROPOSED FACILITY WOULD BE AS FOLLOWS:

	(1) AB8 ANNUAL TAX INCREMENT		AB8DISTRIBUTION	LESS ERAF SHIFT	AB8 NET TAX REVENUE
COUNTY GENERAL FUND	32.93699%	\$	823,426	\$(405,662)	\$417,764
SHASTA COUNTY WATER AGENCY	0.13459%		3,365	(326)	3,039
COUNTY SCHOOLS SERVICE FUND	3.3.625%		82,656	-0-	82,656
ST&T JUNIOR COLLEGE	7.68088%		192,022	-0-	192,022
FALL RIVER JOINT UNIFIED	40.63601%		1,015,900	- 0-	1,015,900
MAYERS MEMORIAL HOSPITAL	7.33289%		183,322	-0	183,322
BURNEY CEMETERY	1.41009%		35,252	(6,380)	28,872
BURNEY FIRE PROTECTION DISTRICT	1.65417%		41,354	(5,139)	36,215
BURNEY MOSQUITO ABATEMENT	4.90813%		122,703	(17,250)	105,453
ERAF SCHOOL SHIFT (2)	<u>0.00000%</u>		<u>-</u>	<u>434,757</u>	<u>434,757</u>

- (1) In 1979, Assembly Bill 8 established a permanent formula for determining property tax revenue to be received by Local Agencies to schools for the 1979/1980 fiscal year and each year thereafter. AB8 also established a procedure for determining how growth in Local Assessed Value would be shared by Local Agencies and Schools.
- (2) In 1992, Senate Bills 617, 844 and 1559 and Assembly Bill 3027 modified the AB8 formula to transfer funds from Local Agencies to Schools. These changes required a complicated formula, for each county, that removed 1992/93 fiscal year property tax revenue from most local agencies and deposited that revenue into an Educational Revenue Augmentation Fund (ERAF). The ERAF is distributed to School Entities. In 1993, Senate Bills 1135 and 837 and Assembly Bills 1519, 557, and 2371 provided additional transfer of property tax revenues from Local Agencies to the ERAF for distribution to Schools.

(Source: Ex. 56, p. 256.)

2. Operation Impacts

During project operation, Applicant will employ 20-25 full-time workers, purchase materials and supplies locally, and provide annual property tax revenue. (Ex. 56, p. 252.) Annual payrolls during operations are estimated at more than \$1.5 million dollars. (Ex. 1, p. 6.7.2.1.) In 2002, an exact estimate is \$1,535,792, which is inflated to year 2002 dollars. (*Ibid.*)

Yearly operations expenditures, exclusive of labor costs, are estimated at approximately \$4 million dollars per year; approximately \$800,000 worth of consumables, such as parts, motors, lubricants and oils may be purchased from Shasta County sources. (Ex. 1, § 6.7.2.1; Ex. 16, Testimony of C. Michael Costanzo, p. 3.)

3. Environmental Justice⁸²

⁸² Executive Order 12898, February 1994, deals with "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." (Ex. 56, p. 251.) Executive Order 12898 requires federal agencies and some state agencies receiving federal funds to identify and address disproportionately high and adverse human health or environmental effects of their programs on minority and low-income populations. (*Ibid.*) However, the Energy Commission has typically included this topic in our power plant siting decisions to ensure that any potential adverse impacts on identified populations have been addressed.

No environmental justice concerns are present in this case based upon population screenings conducted by Applicant and Staff.⁸³ (3/21 RT 87-88; Ex. 1, § 6.7.1.3; Ex. 56, pp. 255-257; see Table 2, below.)

⁸³ Threshold demographic profiles for purposes of application of an environmental justice analysis is 50% minority or low income, or a minority or low income population that is meaningfully greater than the percentage in the general population. (See Counsel on Environmental Quality's 1997 Guidance titled Environmental Justice Guidance Under the National Environmental Policy Act, and EPA's April 1998 Final Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analyses, which are the federal interpretive guidance documents on Executive Order 12898.)

SOCIOECONOMICS Table 2
Demographic Profile for Burney and Shasta County

Burney		Shasta County	
White	3250	White	139,977
Black	5	Black	1081
American Indian, Eskimo or Aleut	113	American Indian, Eskimo or Aleut	3885
Asian or Pacific Islander	16	Asian or Pacific Islander	2684
Other Race	39	Other Race	1340
<p style="text-align: center;">1990 US Census Data. Statistical Information on population</p>			

(Source: Ex. 56, p. 257.)

Staff visited the Burney area several times and talked with individuals about the presence of minority and low-income populations. (Ex. 56, p. 257.) The results of these visits and discussions can be summarized as follows:

- the makeup of the general population is heterogeneous in nature without a concentration of a minority, low-income or Native American population in any specific location;
- TMPP is on and surrounded by ancestral lands of Pit River Native Americans; a tribe composed of eleven “bands” that have lived in the local area for thousands of years;
- Staff has contacted the Pit River Tribal Council, the Native American Heritage Commission, the Bureau of Indian Affairs, and the EPA to determine whether Three Mountain will significantly impact the Pit River Native Americans;
- The nearest Pit River Tribe reservation is located in Burney approximately one mile southeast of the project site, and consists of a casino, health center, child care center and one or two residences which are on or near the reservation;
- There are a few of Pit River members who live in Johnson Park approximately one mile north of the project site; and
- Three Mountain’s construction and operation is not expected to have a disproportionately high and adverse impact on Pit River tribal members. (Ex. 56, p. 255-256.)

Accordingly, based upon the above facts we conclude that there are no environmental justice issues concerning construction and operation of the Three Mountain Power Project.

4. Cumulative Impacts

Applicant has identified three projects in the Burney area subject to CEQA review of their applications as follows:

- Burney Water District’s (BWD) water storage capacity expansion;
- residential development along Black Ranch Road;
- commercial development project that would be located northeast of Three Mountain. (Ex. 56, p. 256.)

BWD's expansion project should be completed. (Ex. 56, p. 256.) Residential development along Black Ranch Road according to Staff is likely to stall because of environmental constraints, general plan inconsistencies and public opposition. (*Ibid.*) The commercial development project is approved, but construction has not yet started; it may be delayed indefinitely and could be built in phases. (*Ibid.*)

We conclude that the Three Mountain Power Project will not cause or create any adverse cumulative socioeconomic impacts. Some local laborers will be part of the construction and operation of the facility. The influx of workers to the Burney area will have a beneficial impact on the local economy. Housing, medical services and schools will not be adversely impacted. Property tax revenues from the project will benefit school, fire and other districts in the Burney area and Shasta County.

FINDINGS AND CONCLUSIONS

Based on the uncontroverted evidence of record, we make the following Findings and Conclusions:

1. Shasta County, which includes Burney, the Redding area, and surrounding communities, can supply the largest component of the necessary laborers needed to supply the Three Mountain Power Project.
2. Most laborers will probably commute to the site daily from the City of Redding during the 24-month construction period.
3. The influx of workers to the Burney area will have a beneficial impact on the local economy.
4. The construction payroll for the Three Mountain Power Project will total between \$23.8 and \$27.2 million dollars, with about \$2.3 million paid out during the peak month of construction.
5. The Three Mountain Power Project will not result in significant adverse effects to local employment, housing, schools, public utilities, or emergency services.
6. Yearly operations expenditures for the Three Mountain Power Project, exclusive of labor costs, are estimated at approximately \$4 million dollars per year.
7. Approximately \$800,000 worth of consumables, such as parts, motors, lubricants and oils may be purchased from Shasta County sources.

8. The project will provide an estimated \$2.5 million dollars in annual property tax revenues that will accrue to Shasta County.
9. There are no environmental justice concerns arising out of construction and operation of the Three Mountain Power Project.
10. Construction and operation of the project will not result in any direct, indirect, or cumulative adverse socioeconomic impacts.

We therefore conclude that implementation of the Conditions of Certification will ensure that the project complies with all applicable laws, ordinances, regulations, and standards relating to socioeconomic factors as identified in the pertinent portions of APPENDIX A.

CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner and its contractors and subcontractors shall recruit employees, including members of the PIT River Tribe when appropriate, and procure materials and supplies within the Burney area and Shasta County first, and other counties second unless:

- to do so will violate federal and/or state statutes;
- the materials and/or supplies are not available;
- qualified employees for specific jobs or positions are not available; or
- there is a reasonable basis to hire someone for a specific position outside of the local area.

Verification: At least 60 days prior to the start of construction, the project owner shall submit to the Energy Commission Compliance Project Manager (CPM) copies of contractor, subcontractor, and vendor solicitations and guidelines stating hiring and procurement requirements and procedures. In addition, the project owner shall notify the CPM in each Monthly Compliance Report of the reasons for any planned procurement of materials or hiring outside the local regional area that will occur during the next two months.

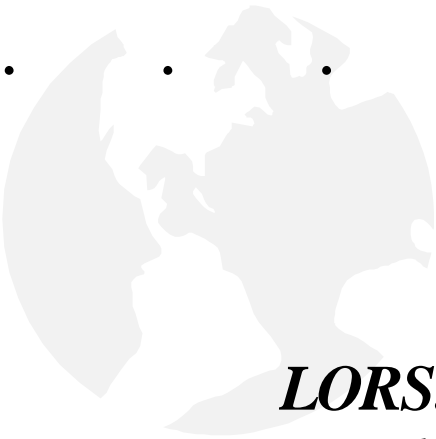

SOCIO-2 Prior to the start of construction, the project owner shall reach agreement with Shasta County and the Burney Fire District on the amount and timing of funds the project owner will provide to cover the following equipment and training associated with hazardous materials handling and fire protection:

- One (1) used ladder truck with 100 foot platform;
- Training for Fire Department personnel on ladder truck;
- Training for Department personnel on hazardous materials;
- Three Macaw backpacks.

Verification: At least 60 days prior to the start of construction, the project owner shall submit to the CPM a copy of the agreement with the Burney Fire District which states the amount and timing of funds the project owner will provide to cover project-specific impacts associated with hazardous materials handling and fire protection.



Appendix A



*LORS: Laws, Ordinances,
Regulations, and Standards*

AIR QUALITY

FEDERAL

A new, major facility, located in an area that is not in attainment with the National Ambient Air Quality Standards (NAAQS) (non-attainment area), is subject to the federal New Source Review (NSR) program. The proposed project is located in an area that is designated as attainment for ozone, CO and PM10. The area is unclassified for the federal NO2 and SO2 standards, and therefore, is not subject to the federal NSR requirements for these pollutants. However, the TMPP will be subject to federal Prevention of Significant Deterioration (PSD) review. In general, under the PSD program, the project must comply with Best Available Control Technology (BACT) for PM10, NO2, SO2 and CO and demonstrate that its emission impacts will not significantly degrade the existing ambient air quality in the region. The Environmental Protection Agency (EPA) has delegated the authority to administer the PSD program to the District.

The TMPP's gas turbines are also subject to the federal New Source Performance Standards (NSPS). These standards include a NOx emissions concentration of no more than 75 parts per million (ppm) at 15 percent excess oxygen (ppm@15%O2), and a SOx emissions concentration of no more than 150 ppm@15%O2.

STATE

California State Health and Safety Code, Section 41700, requires that: "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property."

LOCAL

As part of the Commission's licensing process, in lieu of issuing a construction permit to the applicant for the TMPP, the District has prepared and presented to the Commission a Determination of Compliance (DOC). The DOC evaluates whether and under what conditions the proposed project will comply with the District's applicable rules and regulations, as described below. The Commission staff coordinated its air quality analysis with the District staff as it prepared the DOC, and has incorporated the Final DOC recommended conditions of certification in this Final Staff Assessment.

The project is subject to the specific District rules and regulations that are briefly described below:

Rule 2.1: New Source Review (NSR): This local rule requires that the project be equipped with Best Available Control Technology (BACT) for each individual piece of equipment if its emissions exceed 25 pounds a day of reactive organic compounds (VOC) or nitrogen oxides (NOx), or exceed 80 pounds a day of particulate matter less

than 10 microns in diameter (PM10) or sulfur oxides (SOx), or exceed 500 pounds a day of carbon monoxide (CO). In addition, the rule prohibits the approval of a project if the project, including offsets, causes a new violation or makes worse an existing violation of the ambient air quality standards.

Rule 2.2: Emission Reduction Credits and Banking: Provides administrative procedures for quantification, registration and use of emission reduction credits generated from permanent reductions of permitted emissions sources. The requirements include the specific timing of an application for the credits and criteria for approval, such as the emission reduction credits must be real, enforceable, permanent, quantifiable and surplus.

Section (D)(4) states that under no circumstance shall any emission reductions occurring before July 26, 1994, other than those emission reductions described in Section (D)(5), be eligible for emission reduction credit certificates.

Section (D)(5) defines that emission reductions occurring after December 31, 1987 and before July 26, 1994, can be eligible for emission reduction credits if such reductions are actual and have been formally recognized by the District in writing and the emissions were included in the District's emission inventory.

Section J specifies that the method used to calculate the emission reduction credits must be consistent with the method described in the District's NSR rule, which means that the credits shall be equal to the difference between the historical actual emissions and the proposed emissions.

Rule 2.28: Prevention of Significant Deterioration: This rule incorporates all elements and requirements of the Federal Prevention of Significant Deterioration program, including BACT and a modeling demonstration that the project will not significantly degrade the existing ambient air quality in the region.

Rule 3.28: Internal Combustion Engines: This rule establishes a NOx emission limit of 150 ppm and a CO emission limit of 4500 ppm for gas turbines.

Shasta County General Plan Policy AQ-2(e): This Shasta County General Air Quality policy specifies that any new project with emissions of non-attainment pollutants or their precursors exceeding 25 tons per year shall provide appropriate emission offsets.

BIOLOGICAL RESOURCES

FEDERAL

ENDANGERED SPECIES ACT OF 1973

Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.

MIGRATORY BIRD TREATY ACT

Title 16, United States Code, sections 703 - 712, prohibits the take of migratory birds.

BALD EAGLE PROTECTION ACT

Title 16 United States Code, section 668, prohibits take and transport of bald and golden eagles.

CLEAN WATER ACT

Title 33, section 1344 et seq, prohibits the discharge of dredge or fill activities within waters of the U.S. without a Section 404 permit. Section 401 et seq, requires water quality assessment when using 404 permits and for discharges into waters of the U.S.

STATE

CALIFORNIA ENDANGERED SPECIES ACT OF 1984

Fish and Game Code sections 2050 et seq. protects California's rare, threatened, and endangered species.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

California Environmental Quality Act Guidelines Title 14, sections 15000, et. seq.

NEST OR EGGS – TAKE, POSSESS, OR DESTROY

Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs or any bird.

BIRDS OF PREY OR EGGS – TAKE, POSSESS, OR DESTROY

Fish and Game Code section 3503.5 protects California's birds of prey and their eggs by making it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

MIGRATORY BIRDS – TAKE OR POSSESSION

Fish and Game Code section 3513 protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird.

FULLY PROTECTED SPECIES

Fish and Game Code sections 3511, 4700, 5050, and 5515 prohibits take of animals that are classified as Fully Protected in California.

SIGNIFICANT NATURAL AREAS

Fish and Game Code section 1930 et seq. designates certain areas such as refuges, natural sloughs, riparian areas and vernal pools as significant wildlife habitat.

STREAMBED ALTERATION AGREEMENT

Fish and Game Code section 1600 et seq. requires California Department of Fish and Game to review project impacts to waterways, including impacts to vegetation and wildlife from sediment, diversions and other disturbances.

NATIVE PLANT PROTECTION ACT OF 1977

Fish and Game Code section 1900 et seq. designates state rare, threatened, and endangered plants.

CALIFORNIA CODE OF REGULATIONS

Title 14, sections 670.2 and 670.5 list animals of California designated as threatened or endangered.

LOCAL

SHASTA COUNTY GENERAL PLAN

Fish and Wildlife Element sections 65302[d] and 65560, requires proposed projects to demonstrate a high degree of compatibility with any listed species habitat it may affect and designates critical deer wintering areas which provide protection for deer herds.

CULTURAL

FEDERAL

Portions of the routes proposed for the electric transmission lines go across land managed by the US Forest Service (USFS). Therefore this portion of the project would become an "undertaking" according to federal definition and the USFS would become involved as the lead federal agency for cultural and paleontologic resources. If cultural resource sites are identified on non-federal lands and they meet federal criteria for eligibility for listing in the National Register of Historic Places, federal laws also would apply to these resources.

- National Environmental Policy Act (NEPA): Title 42, United States Code, section 4321-et seq., requires federal agencies to consider potential environmental impacts of projects with federal involvement and to consider appropriate mitigation measures.
- Federal Register 48, 44739-44738 190 September 30, 1983: Federal Guidelines for Historic Preservation Projects: The US Secretary of the Interior has published a set of Standards and Guidelines for Archaeology and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archaeological and historic properties. The Secretary's standards and guidelines are used by federal agencies, such as the Forest Service, the Bureau of Land Management, and the National Park Service. The State Historic Preservation Office refers to these standards in its requirements for selection of qualified personnel and in the mitigation of potential impacts to cultural resources on public lands in California.
- National Historic Preservation Act 16 USC 470 requires federal agencies to take into account the effects of their undertakings on historic properties through consultations beginning at the early stages of project planning. Regulations revised in 1997 (36 CFR Part 800 et. Sec) set forth procedures to be followed for determining eligibility for nomination, the nomination, and the listing of cultural resources in the National Register of Historic Places (NRHP). The eligibility criteria and the process are used by federal, state and local agencies in the evaluation of the significance of cultural resources. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the State Register of Historic Resources. Recent revisions to Section 106 in 1999 have emphasized the importance of Native American consultation.
- Executive Order 11593, "Protection of the Cultural Environment" May 13, 1971, (36 Federal Register, 8921) orders the protection and enhancement of the cultural environment through providing leadership, establishing state offices of historic preservation, and developing criteria for assessing resource values.
- American Indian Religious Freedom Act; Title 42, United States Code, Section 1996 protects Native American religious practices, ethnic heritage sites, and land uses.

- Native American Graves Protection and Repatriation Act (1990); Title 25, United States Code Section 3001, *et seq.* defines "cultural items", "sacred objects", and "objects of cultural patrimony"; establishes an ownership hierarchy; provides for review; allows excavation of human remains, but stipulates return of the remains according to ownership; sets penalties; calls for inventories; and provides for the return of specified cultural items.

NATIVE AMERICAN

The proposed project site and portions of the project-related linear facility routes lie within the ancestral lands of several Native American tribes. Staff is not aware of any LORS that would specifically apply to the proposed project but representatives of the Pit River Nation and several affected tribal bands have indicated they have strong concerns about the project's potential to affect resources within their ancestral lands. The boundaries of these lands have been confirmed and acknowledged by the federal government in a series of official documents, including the tribal constitution adopted in 1987.

STATE

- Public Resources Code, Section 5020.1 defines several terms, including the following:
 - (j) "Historical resource" includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.
 - (q) "Substantial adverse change" means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.
- Public Resources Code, Section 5024.1 establishes a California Register of Historic Places; sets forth criteria to determine significance; defines eligible properties; and lists nomination procedures. The criteria are essentially the same as those used to determine eligibility to the National Register of Historic Places (NRHP), but they also stipulate that some properties that may not retain sufficient integrity to meet NRHP standards, may still be eligible for the California Register.
- Public Resources Code, Section 5097.5 states that any unauthorized removal or destruction of archaeologic or paleontologic resources on sites located on public land is a misdemeanor. As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority or public corporation, or any agency thereof.
- Public Resources Code, Section 5097.98 defines procedures for notification of discovery of Native American artifacts or remains and for the disposition of such materials.

- Public Resources Code, section 5097.99 prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and sets penalties for these actions.
- Public Resources Code, section 5097.991 states that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated.
- Public Resources Code, section 21000, et seq, California Environmental Quality Act (CEQA). This act requires the analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.
- Public Resources Code, section 21083.2 states that, if a project may affect a resource that has not met the definition of an historical resource set forth in section 21084, then the lead agency may determine whether a project may have a significant effect on "unique" archaeological resources; if so, an EIR shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, such resources must be avoided; if they can't be avoided, mitigation measures shall be required. The law also discusses excavation as mitigation; discusses the costs of mitigation for several types of projects; sets time frames for excavation; defines "unique and non-unique archaeological resources"; provides for mitigation of unexpected resources; and sets financial limitations for this section.
- Public Resources Code, section 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial adverse change in the significance of a historic resource; the section further defines a "historic resource" and describes what constitutes a "significant" historic resource.
- CEQA Guidelines, Title 14, California Code of Regulations, section 15126.4 "Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects", sub-section (b) "Mitigation Measures Related to Impacts on Historical Resources". Subsection (b) discusses impacts of maintenance, repair, stabilization, restoration, conservation, or reconstruction of a historical resource; documentation as a mitigation measure; and mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery through excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.
- CEQA Guidelines, Title 14, California Code of Regulations, section 15064.5 "Determining the Significance of Impacts to Archaeological and Historical Resources". Subsection (a) defines the term "historical resources". Subsection (b) explains when a project may be deemed to have a significant effect on historic resources and defines terms used in describing those situations. Subsection (c) describes CEQA's applicability to archaeological sites and provides a bridge between the application of the terms "historic resources" and a "unique archaeological resources".

- CEQA Guidelines, Title 14, California Code of Regulations, section 15064.7 "Thresholds of Significance". This section encourages agencies to develop thresholds of significance to be used in determining potential impacts and defines the term "cumulatively significant".
- CEQA Guidelines, Appendix G: "Issue V: Cultural Resources". Lists four questions to be answered in determining the potential for a project to impact archaeological, historic, and paleontologic resources.
- California Penal Code, section 622.5. Anyone who willfully damages an object or thing of archaeological or historic interest can be found guilty of a misdemeanor.
- California Health and Safety Code, section 7050.5. If human remains are discovered during construction, the project owner is required to contact the county coroner.
- Public Resources Code, section 5097.98. If the county coroner determines that the remains are Native American, the coroner is required to contact the Native American Heritage Commission, which is then required to determine the "Most Likely Descendant" to inspect the burial and to make recommendations for treatment or disposition of the remains and any associated burial items.
- Executive Order W-26-92. By order of the governor, all state agencies must preserve and maintain all significant heritage resources of the state. This includes maintaining the resources under its control; directing its policies, plans, and programs to preserve state-owned significant resources; ensuring that the protection of significant resources are given full consideration in all decisions, and consulting with the California State Office of Historic Preservation to ensure that plans and programs contribute to the preservation and enhancement of significant state-owned resources (TMPP 1999a).
- In addition, the order mandates that each state agency shall designate an Agency Preservation Officer to ensure that the agency's policies regarding the protection of resources within its jurisdiction are carried out. Finally, each agency is required to develop a cultural resources management plan that is reviewed annually. [TMPP 1999a, page 6.2-74].

LOCAL

Although the Energy Commission has pre-emptive authority over local laws, it typically ensures compliance with local laws, ordinances, regulations, standards, plans, and policies. The project site and associated linear facilities are all located within unincorporated portions of eastern Shasta County.

SHASTA COUNTY

According to the Application for Certification (AFC), the Heritage Resources Element of the Shasta County General Plan addresses cultural resources. The objective of this element is the protection of significant prehistoric and historic resources. Policy HRE-a states:

Development projects in areas of known heritage value shall be designated to minimize degradation of these resources. Where conflicts are unavoidable, mitigation measures which reduce such impacts shall be implemented. Possible mitigation measures may include clustering, buffer or non-disturbance zones, and building siting requirements (TMPP 1999a).

Shasta County staff presented a set of recommended mitigation measures for the TMPP in a letter to Commission staff, dated October 6, 1999. Item 3 of the county's statement of conditions addresses cultural resources (Kaminski 1999a). This condition is presented later in this section, in the discussion of mitigation measures.

EFFICIENCY

FEDERAL

No federal laws apply to the efficiency of this project.

STATE

CALIFORNIA ENVIRONMENTAL QUALITY ACT GUIDELINES

CEQA Guidelines state that the environmental analysis "...shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy" (Cal. Code Regs., tit. 14, § 15126.4(a)(1)). Appendix F of the Guidelines further suggests consideration of such factors as the project's energy requirements and energy use efficiency; its effects on local and regional energy supplies and energy resources; its requirements for additional energy supply capacity; its compliance with existing energy standards; and any alternatives that could reduce wasteful, inefficient and unnecessary consumption of energy (Cal. Code regs., tit. 14, § 15000 et seq., Appendix F).

LOCAL

No local or county ordinances apply to power plant efficiency.

FACILITY DESIGN

The applicable LORS for each engineering discipline, civil, structural, mechanical and electrical, are included as part of the engineering appendices, Appendices M through Q, and summarized in Section 7.3, Table 7.1-1 and Section 8, Engineering (TMPP 1999a). A summary of these LORS includes: Title 24, California Code of Regulations, which adopts the current edition of the California Building Code (CBC) as minimum legal building standards; the 1998 CBC for design of structures; American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code; and National Electrical Manufacturers Association (NEMA) standards.

GEOLOGY AND PALEONTOLOGY

FEDERAL

There are no federal LORS for geological hazards and resources, or grading and erosion control. The Three Mountain Power Project (TMPP) is not located on lands under the jurisdiction of the United States Bureau of Land Management. It is Energy Commission staff's understanding that the reconductoring corridor is owned or leased to the Pacific Gas and Electric Company. A portion of the reconductoring corridor is understood to cross land administered by the United States Forest Service, but leased to the Pacific Gas and Electric Company.

The Federal Land Policy and Management Act (FLPMA), Title 43, United States Code sections 1701-1784, requires that public land be managed in such a way that items of scientific interest (including paleontological resources) are protected.

STATE AND LOCAL

The California Building Code (CBC) 1998 edition is based upon the Uniform Building Code (UBC), 1997 edition, which was published by the International Conference of Building Officials. The CBC is a series of standards that are used in the investigation, design (Chapters 16 and 18) and construction (including grading and erosion control as found in Appendix Chapter 33) that were based upon the UBC that includes supplemental standards specific to California. The CBC supplements their grading and construction ordinances and regulations. The California Environmental Quality Act (CEQA) Guidelines Appendix G provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature. Sections (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geological hazards.

Sections (X) (a) and (b) pose questions about the project's effect on mineral resources. Public Resources Code section 5097.5 requires that no person shall cause the destruction or removal of vertebrate paleontologic resources on public lands unless express permission of the public agency having jurisdiction over the lands has been granted.

The Standard Procedures, Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources (SVP 1994) are a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. They were adopted in October 1994 by a national organization of vertebrate paleontologists (the Society of Vertebrate Paleontologists).

HAZARDOUS MATERIALS MANAGEMENT

FEDERAL

The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III and Clean Air Act of 1990 established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The Act (codified in 40 C. F. R., § 68.110 et seq.) requires the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility.

STATE

The requirements of the federal acts described above are reflected in the California Health and Safety Code section 25531 et seq. The California Health and Safety Code section 25534 directs facility owners storing or handling acutely hazardous materials in reportable quantities, to develop a Risk Management Plan (RMP) and submit it to appropriate local authorities, the United States Environmental Protection Agency (EPA), and the designated local Administering Agency for review and approval. The plan must include an evaluation of the potential impacts associated with an accidental release, the likelihood of an accidental release occurring, the magnitude of potential human exposure, any preexisting evaluations or studies of the material, the likelihood of the substance being handled in the manner indicated, and the accident history of the material. This new, recently developed program supersedes the California Risk Management and Prevention Plan (RMPP). This requirement is not applicable to the proposed TMPP project as none of the materials proposed for use are listed as acutely hazardous. The aqueous ammonia proposed for use at the facility will be exempt because the ammonia concentration in solution is 19%.

Title 8, California Code of Regulations, section 5189, requires facility owners to develop and implement effective safety management plans to insure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.

California Health and Safety Code, section 41700, requires that "No person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property."

LOCAL AND REGIONAL

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials. These provisions are contained in Articles 79 and 80. The latest revision to Article 80 was in 1997 (UFC, 1997). These articles contain minimum setback requirements for outdoor storage of ammonia.

The California Building Code contains requirements regarding the storage and handling of hazardous materials. The Chief Building Official must inspect and verify compliance with these requirements prior to issuance of an occupancy permit.

LAND USE

SHASTA COUNTY GENERAL PLAN

The Shasta County General Plan, last updated in 1998, sets forth the general, long-range policies regarding how the county's future development should occur. The General Plan primarily addresses the use of the privately and publicly owned land resources located in the county. The General Plan is not a detailed, parcel-specific policy statement. Instead, it establishes a generalized pattern of future land use which provides the basis for more detailed plans. Its function is to provide a policy framework that must be reflected in the zoning ordinance, specific plans, and other development guidelines (Shasta County 1998, p.1.0.01).

Although there are no specific General Plan policies relating to development of power plants, there are many policies that set standards for industrial development. The General Plan contains mandatory and nonmandatory elements divided into three groups: Public Safety (Seismic and Geologic Hazards, Flood Protection, Dam Failure Inundation, Fire Safety, Noise, and Hazardous Materials); Resources (Agricultural Lands, Timberlands, Minerals, Energy, Air Quality, Water Resources and Water Quality, Fish and Wildlife Habitat, Scenic Highways, Open Space and Recreation, and Heritage Resources); and Community Development (Community Organization and Development, Economic Development, Housing Element, Circulation, Public Facilities, and Design Review). Many of these elements are discussed in the relevant sections of this assessment. Portions of the General Plan relevant to land use are addressed below.

One primary General Plan strategy that relates to the project is the approach to growth. The General Plan adopts a strategy of growth accommodation (Shasta County 1998, p.3.0.02). The plan states that growth may be accommodated and the quality of life may be preserved if County government, through the General Plan and its implementing regulations, directs growth to areas of the County where and when the land supply is available to accommodate growth. The General Plan (p.2.0.03) acknowledges that industrial and other growth has occurred in areas including Burney Valley where conditions have been conducive. The historic growth pattern has resulted in nearly 90% of the population of the County residing in 2 of the 10 planning areas (South Central Region – 84%; North East Shasta – 5.5%) based on 1990 Census data. The project is located in the North East Shasta Planning Area. The General Plan recognizes the primary role in accommodating new population growth will be assumed by the South Central Region and North East Shasta Planning Areas (Shasta County 1998, p.3.0.03).

Section 7.1 – Community Organization and Development Pattern

Policy Co-f: The General Plan shall contain residential, commercial, and industrial land use categories, each of which is described in the following tables and shall be implemented through more specific zone districts:

- CO-7 – Residential

- CO-8 – Commercial
- CO-9 – Industrial

Table CO-9 of the General Plan shows industrial land use categories and policies. In regard to locational requirements, it states that General Industrial uses should be located along a freeway, highway, or arterial. They are designated on the General Plan land use Map as Industrial (I).

ZONING ORDINANCE

Government Code Section 65860 requires that the County's zoning ordinance be consistent with its General Plan. The Shasta County Zoning Plan (Title 17 of the Shasta County Code) (Shasta County 1999a) was most recently amended on July 23, 1999. The purpose of the zoning ordinance is to promote and protect the public health, safety, peace, morals, comfort, convenience, and general welfare; to implement the county general plan; to facilitate and guide growth in accordance with the general plan; and to protect the social and economic stability of residential, commercial, industrial, resource production, and recreational activities within the county through the orderly, planned use of the land (Section 17.02.010).

The following sections of the Zoning Ordinance are applicable to the project.

Chapter 17.58 – General Industrial (M) District.

Subchapter 17.58.010 states that this district is consistent with the industrial (I) general plan land use designation.

Subchapter 17.58.030 (I) includes power generating plants as a use permitted in the M district if a use permit is issued.

Subchapter 17.58.050 specifies site development standards. One standard (D) is that maximum structural height is 45 feet.

Standard K requires an applicant for either a building permit or a use permit to submit a site plan which lists how the standards listed in the section will be met.

Chapter 17.78 – Design Review District

Subchapter 17.78.010 states that the design review (DR) district is intended to be combined with any principal district for one or more of the following purposes:

- To protect areas having unique environmental, physical, historical or scenic features;
- To promote development which features a variety of amenities and design features;
- To encourage creative approaches to use of land and related physical environment;
- To obtain advantages of coordinated, flexible, comprehensive, long-range planning;

- To ensure compatibility with surrounding land uses;
- To protect the public's health and safety.

The regulations of this district prevail over any conflicting regulation of any principal district with which this district is combined.

Subchapter 17.78.020 states that the uses permitted outright and those permitted with a zoning, administrative, or use permit in the principal district are permitted in the DR district if a use permit is issued [except for commercial use, which requires an administrative permit.

Subchapter 17.78.030 states that site development standards in the DR district shall, in the aggregate, meet or exceed the standards prescribed by the regulations for the principal district.

Each DR district shall be provided design review guidelines which direct the implementation of objectives for the district. In cases where there are no adopted countywide or community design guidelines for an area, the following general design review standards shall be met:

1. A design theme is prepared and established which takes into account the relationship of the project to the surrounding area, including, but not limited to, the proposed project's visual appeal and character, scale of development and sense of proportionality, building size and dimension, mix and pattern of color and architectural variation, lighting, signing and other physical relationships affecting appearance between various architectural styles found in and around the development.
2. Landscaping, consistent with the design theme, is provided which provides shading over 50 percent or more of parking and pedestrian areas within the project ten years after completion of the project.

Chapter 17.84 – General Development Standards

Subchapter 17.84.030 (B) addresses exceptions to height limitations, and includes the following elements relevant to the project.

Roof Structure: Smokestacks are exempted.

Transmission Lines: Electric transmission lines and towers are exempted.

Use Permit: Any structure in any district may be erected to a greater height than the limit established for the district in which the structure is to be located, provided that a use permit is issued.

Chapter 17.86 – Off-Street Parking and Loading Regulations

This chapter includes a number of parking-related requirements, including the following items relevant to the project:

Subchapter 17.86.130 requires that a parking plan be submitted to and approved by the planning director prior to issuance of a building permit or use permit. This plan may be combined with a landscaping plan.

Subchapter 17.86.140 establishes parking standards, including for industry one parking space for each 1,000 square feet of manufacturing or warehousing area, or per employee, whichever is greater, plus one parking space for each 300 square feet of office area.

Chapter 17.88 - Special Uses

Subchapter 17.88.100 addresses public uses and public utilities, including transmission lines and towers. Item (A) specifies that public utility transmission lines and towers are permitted uses, regardless of height.

NEED CONFORMANCE

Public Resources Code prohibits the Energy Commission from certifying a power plant unless the Commission makes a finding that the facility is "needed" in accordance with the Commission's integrated assessment of the need for new resource additions. (See, Pub. Resources Code §§ 25523(f) and 25524(a).) The Public Resources Code directs the Commission to do an "integrated assessment of need," taking into account 5- and 12-year forecasts of electricity supply and demand, as well as various competing interests, and to adopt the assessment in a biennial electricity report.

On September 28, 1999, the Governor signed Senate Bill No. 110, which became Chapter 581, Statutes of 1999. This legislation repeals Public Resources Code sections 25523(f) and 25524(a) and amends other provisions relating to the assessment of need for new resources. It thereby removes the requirement that, to certify a proposed facility, the Commission must make a specific finding that the proposed facility is in conformance with the adopted integrated assessment of need. Regarding need-determination, Senate Bill 110 states:

Before the California electricity industry was restructured the regulated cost recovery framework for powerplants justified requiring the commission to determine the need for new generation, and site only powerplants for which need was established. Now that powerplant owners are at risk to recover their investments, it is no longer appropriate to make this determination.

(Pub. Resources Code, § 25009, added by Stats. 1999, ch. 581, § 1.) Senate Bill 110 takes effect on January 1, 2000 (Cal. Const. Art. 4, § 8.). As of that date, the Commission will no longer be required to determine if a proposed project conforms with an integrated assessment of need. As a result, any application for certification for which the Commission adopts a final decision after January 1, 2000, is not subject to a finding of "need-conformance."

In this case, the Commission's final decision will be made after January 1, 2000. Therefore, because of SB 110, the Commission will make no finding of "need-conformance" with respect to the proposed project.

NOISE

FEDERAL

Under the Occupational Safety and Health Act of 1970 (29 USC § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 CFR § 1910.95) that establish maximum noise levels to which workers at a facility may be exposed. These OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time during which the worker is exposed. OSHA regulations also dictate hearing conservation program requirements and workplace noise monitoring requirements. The administering agency for the above authority is the Federal Occupational Safety and Health Administration (Fed-OSHA).

Noise Control Act of 1972 (42 USC § 4901 et seq.; 40 CFR Parts 201-211) sets performance standards for noise emissions from "major sources." The Environmental Protection Agency (EPA) has identified a day/night level (Ldn) of 55 dBA as providing reasonable protection against community annoyance and activity interference due to noise. EPA administers the Noise Control Act.

STATE

There are no state regulations governing off-site (community) noise. Rather, state planning law (Gov. Code, § 65302) requires that all counties and cities prepare and adopt a General Plan. Government Code section 65302(f) requires that a noise element be prepared as part of the General Plan. This element is to "address existing and foreseeable noise problems...." Other state laws, ordinances, regulations and standards (LORS) include the California Environmental Quality Act (CEQA) and the California Occupational Safety and Health Act (Cal-OSHA).

California Vehicle Code, sections 23130 and 23130.5, sets noise limits for highway vehicles. The California Highway Patrol and the Shasta County Sheriff's Office administer the vehicle code.

CAL-OSHA

California Occupational Safety and Health Administration (Cal-OSHA) has promulgated Occupational Noise Exposure Regulations that set employee noise exposure limits.

Cal-OSHA regulations (Cal. Code Regs., tit. 8, § 5095 et seq.) are the same as the federal OSHA criteria described above. The criteria are based on a worker's noise level exposure over a specific time period. Maximum permissible worker noise exposure levels to protect against damage to the workers' hearing have been established. The administering agency is Cal-OSHA.

CEQA

CEQA requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. The applicable CEQA Guidelines (Cal. Code Regs., tit. 14, §15000 et seq., Appendix G § XI) explain that a significant effect from noise may exist if a project would result in:

1. Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
2. Exposure of persons to, or generation of, excessive ground borne vibration or ground borne noise levels.
3. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
4. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

LOCAL

SHASTA COUNTY GENERAL PLAN - NOISE ELEMENT

The Shasta County General Plan 1998 contains a Noise Element that establishes environmental noise limits based on the land use of the property receiving the noise. The administering agency for the above authority is the Shasta County Department of Planning and Development Services.

PUBLIC HEALTH

FEDERAL

The Clean Air Act of 1970 (42 U.S.C., section 7401 et seq.) required establishment of ambient air quality standards to protect the public from the effects of air pollutants. These standards have been established by the United States Environmental Protection Agency (EPA) for the major air pollutants: nitrogen dioxide, ozone, sulfur dioxide, carbon monoxide, sulfates, particulate matter with a diameter of 10 micron or less (PM10) and lead).

STATE

California Health and Safety Code section 39606 requires the California Air Resources Board (ARB) to establish California's ambient air quality standards to reflect the California-specific conditions that influence its air quality. Such standards have been established by the ARB for ozone, carbon monoxide, sulfur dioxide, PM10, lead, hydrogen sulfide, vinyl chloride and nitrogen dioxide. The same biological mechanisms underlie some of the health effects of most of these criteria pollutants as well as the noncriteria pollutants. The California standards are listed together with the corresponding federal standards in the Air Quality section of this PMPD.

California Health and Safety Code section 41700 states that "No person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause or have a natural tendency to cause injury or damage business or property."

The California Health and Safety Code section 39650 et seq. mandates that the California Environmental Protection Agency (Cal-EPA) establish safe exposure limits for toxic, noncriteria air pollutants and identify the best available methods for their control. These laws also require that the new source review rules for each air district include regulations establishing procedures to control the emission of these pollutants. The toxic emissions from natural gas combustion are listed in ARB's April 11, 1996 California Toxic Emissions Factors (CATEF) database for natural gas-fired combustion turbines. Cal-EPA has developed specific cancer potency estimates for assessing their related cancer risks at specific exposure levels. For noncancer-causing toxic air pollutants, Cal-EPA established specific no-effects levels (known as reference exposure levels) for assessing the likelihood of producing health effects at specific exposure levels. Such health effects would be considered significant only when exposure exceeds these reference levels.

California Health and Safety Code section 44300 et seq. requires facilities, which emit large quantities of criteria pollutants and any amount of noncriteria pollutants to provide the local air district an inventory of toxic emissions. Such facilities may also be required

to prepare a quantitative health risk assessment to address the potential health risks involved. The ARB and the Air Quality Management District will ensure implementation of these requirements for the proposed project.

LOCAL

The Shasta County Air Quality Management District (District) has no specific rules implementing Health and Safety Code section 44300. It does, however, require the results of a health risk assessment as part of the application for the Determination of Compliance. TMPP has complied with this requirement.

RELIABILITY

Presently, there are no laws, ordinances, regulations or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the Commission must make findings as to the manner in which the project is to be designed, sited and operated to ensure safe and reliable operation (Cal. Code Regs., tit. 20, § 1752(c)).

SOCIOECONOMICS

FEDERAL

Executive Order 12898, “Federal Actions to address Environmental Justice in Minority Populations and Low-Income Populations,” focuses federal attention on the environment and human health conditions of minority communities and calls on agencies to achieve environmental justice as part of their mission. The order requires the Environmental Protection Agency (EPA) and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this issue. In all Applications for Certification, the Energy Commission staff identify and address any disproportionately high and/or adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

STATE

CALIFORNIA GOVERNMENT CODE, SECTION 65996-65997

As amended by SB 50 (Stats. 1998, ch. 407, sec. 23), states that public agencies may not impose fees, charges or other financial requirements to offset the cost for school facilities.

SOIL AND WATER RESOURCES

FEDERAL CLEAN WATER ACT

The Clean Water Act (33 USC section 1257 et seq.) requires states to set standards to protect water quality. Point source discharges to surface water are regulated by this act through requirements set forth in a National Pollutant Discharge Elimination System (NPDES) Permit. Stormwater discharges during construction and operation of a facility also fall under this act and must be addressed through either a project specific or general NPDES permit. In California, the nine Regional Water Quality Control Boards (RWQCB) administer the requirements of the Clean Water Act.

STATE

The Porter-Cologne Water Quality Control Act of 1967, Water Code section 13000 et seq., requires the State Water Resources Control Board (SWRCB) and the nine regional RWQCBs to adopt water quality criteria to protect state waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards and implementation procedures. The criteria for the project area are contained in the Central Valley Region Water Quality Control Plan (Basin Plan 1994). This plan sets numerical and narrative water quality standards controlling the discharge of wastes with elevated temperature to the state's waters.

Section 13552.6 of the Water Code specifically states that the use of potable domestic water for cooling towers, if suitable recycled water is available, is an unreasonable use of water. The availability of recycled water is based upon a number of criteria, which must be taken into account by the SWRCB. These criteria are that: the quality and quantity of the recycled water are suitable for the use; the cost is reasonable, the use is not detrimental to public health, will not impact downstream users or biological resources, and will not degrade water quality.

Section 13552.8 of the Water Code states that any public agency may require the use of recycled water in cooling towers if certain criteria are met. These criteria include that recycled water is available and meets the requirements set forth in section 13550; the use does not adversely affect any existing water right; and if there is public exposure to cooling tower mist using recycled water, appropriate mitigation or control is necessary.

The SWRCB has also adopted a number of policies that provide guidelines for water quality protection. The principle policy of the State Board which addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling (adopted by the Board on June 19, 1976 by Resolution 75-58). This policy states that use of fresh inland waters should only be used for powerplant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. This SWRCB policy recommends that power plant cooling water should, in order of priority come from wastewater being discharged to the ocean, ocean water, brackish water from natural

sources or irrigation return flow, inland waste waters of low total dissolved solids, and other inland waters. This policy goes on to address cooling water discharge prohibitions. This project as currently designed does not require Waste Discharge Requirements (WDRs) because no wastewater will be discharged.

***THE SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986
(PROPOSITION 65)***

The Safe Drinking Water and Toxic Enforcement Act of 1986, Health and Safety Code section 25249.5 et seq., prohibits the discharge or release of chemicals known to cause cancer or reproductive toxicity into drinking water sources.

LOCAL

SHASTA COUNTY GENERAL PLAN

The Shasta County General Plan (General Plan) Chapter 12.12 establishes minimum requirements and requires that a permit be obtained for grading, excavating and filling activities in order to:

1. Control erosion and sedimentation to prevent damage to off-site property and streams, watercourses, and aquatic habitat.
2. Avoid creation of unstable slopes or filled areas.
3. Prevent impairment or destruction of potential leach fields for sewage disposal systems.
4. Regulate de facto development caused by uncontrolled grading.
5. A “major project” grading permit will be required for this project.

TRANSMISSION LINE SAFETY AND NUISANCE

Discussed below by subject area are design-related LORS applicable to the physical impacts of transmission lines as proposed for TMPP. The impacts of concern are addressed through specific federal or state regulations or through established industry standards and practices. There presently are no local laws or regulations specifically aimed at the physical structure or dimensions of electric power lines to limit the impacts noted above.

AVIATION SAFETY

Any hazard to area aircraft relates to the potential for collision with the line in the navigable air space. The applicable federal LORS as discussed below are intended to ensure the distance and visibility necessary to avoid such collisions.

FEDERAL

- Title 14, Part 77 of the Federal Code of Regulations (CFR), “Objects Affecting the Navigation Space” Provisions of these regulations specify the criteria used by the Federal Aviation Administration (FAA) for determining whether a “Notice of Proposed Construction or Alteration” is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved. Such notification allows the FAA to ensure that the structure is located to avoid any significant hazards to area aviation.
- FAA Advisory Circular (AC) No. 70/460-2H, “Proposed Construction and or Alteration of Objects that may Affect the Navigation Space” This circular informs each proponent of a project that could pose an aviation hazard of the need to file the “Notice of Proposed Construction or Alteration” (Form 7640) with the FAA.
- FAA AC No. 70/460-1G, “Obstruction Marking and Lighting”. This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

Transmission line-related radio-frequency interference is one of the indirect effects of line operation produced by the physical interactions of line electric fields. The level of such interference usually depends on the magnitude of the electric fields involved. Because of this, the potential for such impacts could be assessed from field strength estimates obtained for the line. The following regulations are intended to ensure that such lines are located away from areas of potential interference and that any interference is mitigated whenever it occurs.

FEDERAL

- Federal Communications Commission (FCC) regulations in Title 47 CFR, Section 15.25. Provisions of these regulations prohibit operation of any devices producing force fields, which interfere with radio communications, even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. Such interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as corona discharge but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings. When generated, such noise manifests as perceivable interference with radio or television signal reception or interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. Staff usually recommends specific conditions of certification to ensure compliance with this FCC requirement.

STATE

- General Order 52 (GO-52), California Public Utilities Commission (CPUC). Provisions of this order govern the construction and operation of power and communications lines and specifically deal with measures to prevent or mitigate inductive interference. Such interference is produced by the electric field induced by the line in the antenna of a radio signal receiver.

Several design and maintenance options are available for minimizing these electric field-related impacts. When incorporated in the line design and operation, such measures also serve to reduce the line-related audible noise discussed below.

AUDIBLE NOISE

FEDERAL

There are no design-specific federal regulations to limit the audible noise from transmission lines. As with radio noise, such noise is limited instead through design and maintenance standards established from industry research and experience as effective without significant impacts on line safety, efficiency maintainability and reliability. All high-voltage lines are designed to assure compliance. Such noise usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying or hissing sound or hum. Since (as with communications interference), the noise level depends on the strength of the line electric field, the potential for occurrence can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during wet

weather and from lines of 345 kV or higher. It is, therefore, not generally expected at significant levels from lines of less than 345 kV such as the one proposed for TMPP. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a 100-ft right-of-way.

NUISANCE SHOCKS

FEDERAL

There are no design-specific federal regulations to limit nuisance shocks in the transmission line environment. For modern high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). Nuisance shocks are caused by current flow at levels generally incapable of causing significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line electric and magnetic fields.

As with lines of the type proposed, the applicant will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff usually recommends specific conditions of certification to ensure that such grounding is made within the right-of-way by both the applicant and property owners.

FIRE HAZARDS

The fire hazards addressed through the following regulations are those that could be caused by sparks from conductors of overhead lines or that could result from direct contact between the line and nearby trees and other combustible objects.

STATE

- General Order 95 (GO-95), CPUC, “Rules for Overhead Electric Line Construction”. This order specifies tree-trimming criteria to minimize the potential for power line-related fires.
- Title 14 Section 1250 of the California Code of Regulations, “Fire Prevention Standards for Electric Utilities”. This code specifies utility-related measures for fire prevention.

HAZARDOUS SHOCKS

The hazardous shocks that are addressed by the following regulations and standards are those that could result from direct or indirect contact between an individual and the energized line. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines.

FEDERAL

There are no design-specific federal regulations to prevent hazardous shocks from power lines. Safety is assured through compliance with the requirements in the National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines. These provisions specify the minimum national safe operating clearances applicable in areas where the line might be accessible to the public. They are intended to minimize the potential for direct or indirect contact with the energized line.

STATE

- GO-95, CPUC. “Rules for Overhead Line Construction”. These rules specify uniform statewide requirements for overhead line construction regarding ground clearance, grounding, maintenance and inspection. Implementing these requirements ensures the safety of the general public and line workers.
- Title 8, CCR, Section 2700 et seq., “High Voltage Electric Safety Orders”. These safety orders establish essential requirements and minimum standards for safely installing, operating, and maintaining electrical installations and equipment.

ELECTRIC AND MAGNETIC FIELD (EMF) EXPOSURE

The possibility of deleterious health effects from electric and magnetic field exposure has increased public concern in recent years about living near high-voltage lines. Both fields occur together whenever electricity flows, hence the general practice of considering both as EMF exposure. As noted by the applicant, (TMPP 1999a pages 6.9-21 and 6.9-22, and 6.18-4), the available evidence as evaluated by CPUC and other regulatory agencies, has not established that such fields pose a significant health hazard to exposed humans. However, staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore considers it appropriate, in light of present uncertainty, to reduce such fields to some degree, where feasible, until the issue is better understood. The challenge has been to establish when, and how far to reduce them.

While there is considerable uncertainty about the EMF/health effects issue, the following facts have been established from the available information and have been used to establish existing policies:

- Any exposure-related health risk to the exposed individual will likely be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns relate to the magnetic field.

- The measures employed for such field reduction can affect line safety, reliability, efficiency and maintainability, depending on the type and extent of such measures.

FEDERAL

No federal regulations have been established specifying environmental limits on the strengths of fields from power lines. However, the federal government continues to conduct and encourage research necessary for an appropriate policy on the EMF issue.

In the face of the present uncertainty, several states have opted for design-driven regulations ensuring that fields from new lines are generally similar to those from existing lines. Some states (Florida, Minnesota, New Jersey, New York, Montana) have set specific environmental limits on one or both fields in this regard. These limits are, however, not based on any specific health effects. Most regulatory agencies believe, as does staff, that health-based limits are inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

Before the present health-based concern developed, measures to reduce field effects from power line operations were mostly aimed at the electric field component, whose effects can manifest as the previously noted radio noise, audible noise and nuisance shocks. The present focus is on the magnetic field because only it can penetrate building materials to potentially produce the types of health impacts at the root of the present concern. As one focuses on the strong magnetic fields from the more visible transmission and other high-voltage power lines, staff considers it important for perspective, to note that an individual in a home could be exposed for short periods to much stronger fields while using some common household appliances (National Institute of Environmental Health Services and the U.S Department of Energy, 1995). Scientists have not established which of these types of exposures would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than the power line environment.

STATE

In California, the CPUC (which regulates the installation and operation of high-voltage lines in California) has determined that only no-cost or low-cost measures are presently justified in any effort to reduce power line fields beyond levels existing before the present health concern arose. The CPUC has further determined that such reduction should be made only in connection with new or modified lines. It required each utility within its jurisdiction to establish EMF-reducing design guidelines for all new or upgraded power lines and related facilities within their respective service areas. The CPUC further established specific limits on the resources to be used in each case for field reduction. Such limitations were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Utilities not within the jurisdiction of the CPUC voluntarily comply with these CPUC requirements. This PUC policy resulted from assessments made to implement CPUC Decision 93-11-013 of 1989.

In keeping with this CPUC policy, staff requires evidence that each proposed line will be designed according to the EMF-reducing design guidelines applicable to the utility service area involved. These field-reducing measures can impact line operation if applied without appropriate regard for environmental and other local issues bearing on safety, reliability efficiency and maintainability. It is therefore, up to each applicant to ensure that such measures are applied in ways, and to an extent, without significant impacts on line operation. The extent of such applications will be reflected by the ground-level field strengths as measured during operation. When estimated or measured for the line, such field strengths can be used by staff and other regulatory agencies for comparison with fields of lines of similar voltage and current-carrying capacity. Such field strengths can be estimated for any given design using established procedures. Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m), for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends on line voltage (in the case of electric fields), the geometry of the structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since each new line in California is currently required to be designed according to the EMF-reducing guidelines of the utility in the service area involved, their fields are required under existing CPUC policies to be similar to fields from similar lines in that service area. A condition of certification is usually proposed by staff to ensure implementation of the reduction measures necessary.

TRAFFIC AND TRANSPORTATION

FEDERAL

The federal government addresses transportation of goods and materials in Title 49, Code of Federal Regulations:

Sections 171-177 govern the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles.

Sections 350-399, and Appendices A-G, Federal Motor Carrier Safety Regulations, address safety considerations for the transport of goods, materials, and substances over public highways.

STATE

The California Vehicle Code and the Streets and Highways Code contain requirements applicable to the licensing of drivers and vehicles, the transportation of hazardous materials and rights-of-way. In addition, the California Health and Safety Code addresses the transportation of hazardous materials. Specifically, these codes include:

- California Vehicle Code, Section 353, defines hazardous materials. California Vehicle Code, Sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- California Vehicle Code, Sections 31600-31620, regulates the transportation of explosive materials.
- California Vehicle Code, Sections 32000-32053, regulates the licensing of carriers of hazardous materials and includes noticing requirements.
- California Vehicle Code, Sections 32100-32109, establishes special requirements for the transportation of inhalation hazards and poisonous gases.
- California Vehicle Code, Sections 34000-34121, establishes special requirements for the transportation of flammable and combustible liquids over public roads and highways.
- California Vehicle Code, Sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-7, 34506, 34507.5 and 34510-11, regulates the safe operation of vehicles, including those which are used for the transportation of hazardous materials.
- California Health and Safety Code, Sections 25160 et seq., addresses the safe transport of hazardous materials.
- California Vehicle Code, Sections 2500-2505, authorizes the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials, including explosives.

- California Vehicle Code, Sections 13369, 15275, and 15278, addresses the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, it requires the possession of certificates permitting the operation of vehicles transporting hazardous materials.
- California Streets and Highways Code, Sections 117 and 660-72, and California Vehicle Code, Sections 35780 et seq., require permits for the transportation of oversized loads on county roads.
- California Streets and Highways Code, Sections 660, 670, 1450, 1460 et seq., 1470, and 1480, regulates right-of-way encroachment and the granting of permits for encroachments on state and county roads.
- The Caltrans' Route Concept Report for State Route 299 includes the following policies which are pertinent to the congestion attributable to the proposed project:
- Caltrans shall strive to maintain a minimum Level of Service C during peak hour traffic operations.

All construction within the public right-of-way will need to comply with the "Manual of Traffic Controls for Construction and Maintenance of Work Zones" (Caltrans, 1996).

LOCAL

SHASTA COUNTY

The Shasta County General Plan, in its transportation and circulation element, includes the following policies which are pertinent to the proposed project:

New commercial and industrial development accessing arterials and collectors shall provide access controls for public safety by means such as limiting the location and number of driveway access points and controlling ingress and egress turning movements.

Discretionary uses located in areas designated Mixed Use (MU), Commercial (C), or Industrial (I) shall be served by a paved road. The County shall obtain street right-of-way dedications with the approval of subdivisions, use permits, and other discretionary actions. All other non-residential discretionary uses not located in a General Plan area described above, excepting resource designations, shall ultimately be served by a paved road, unless deferred or waived, based on traffic generation factors.

Adequate truck access to off-street loading areas in commercial and industrial areas shall be provided in all new development applications.

Project proponents shall be required to implement effective measures included in the County's lists of Standard Mitigation Measures (SMM) and Best Available Mitigation

Measures (BAMM) to reduce vehicle use and associated emissions related to existing and future land use development as part of the environmental review process.

The Shasta County Public Works Department requires a transportation permit for oversized vehicles using a county road (see also California Streets and Highways Code section above) and an encroachment permit for any encroachment in any county roadway (see California Streets and Highways Code above).

TRANSMISSION SYSTEM ENGINEERING

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction," formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance, operation or use of overhead electric lines and to the public in general.
- CPUC Rule 21 provides standards for the reliable connection of parallel generating stations connected to participating transmission owners.
- Western Systems Coordinating Council (WSCC) Reliability Criteria provides the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria includes the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 "Criteria for Transmission System Contingency Performance" which requires that the results of power flow and stability simulations verify established performance levels. Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a performance level that only seeks to prevent system cascading and the subsequent blackout of island areas during major disturbances (such as loss of all lines in a right of way). While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).
- North American Electric Reliability Council (NERC) Planning Standards provides policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions, however the NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).
- Cal-ISO Reliability Criteria also provide policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency

Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid.

- Cal-ISO Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria. These standards will be applied the assessment of the system reliability implications of the Three Mountain Power Project. Also of major importance to the TMPP, and other privately funded projects which may sell through the California Power Exchange (Cal-PX) are the Cal-ISO Day/Hour Ahead Inter-zonal Congestion Management Scheduling Protocol (SP 10), the Transmission System Loss Management Scheduling Protocol (SP 4), and the Creation of the Real Time Merit Order Stack (SP 11). The Congestion Management Scheduling Protocol provides that the operation of power plants not violate system criteria when market participants request generation dispatch or the use of major interties. The Real Time Merit Order Stack is developed based on increasing energy bid prices so that the least cost bids are accepted early on and if congestion is anticipated the highest bids are not selected. The Transmission System Loss Management Scheduling Protocol uses the Cal-ISO power flow model to identify the effects on total transmission losses at each generating unit and scheduling point. Additional calculations are performed to the actual net power output required by the generating units meet their scheduled obligations (Cal-ISO 1998b, Cal-ISO 1998c).
- Cal-ISO Participating Generator Agreement consists of detailed explanations of the requirements in the Cal-ISO Tariff pertaining to the paralleled generating unit.

VISUAL RESOURCES

FEDERAL AND STATE

The proposed project, including the linear facilities, is located on private lands and is thus not subject to federal land management requirements. Likewise, no roadway in the project vicinity is a designated or eligible State Scenic Highway. Therefore, no federal or state regulations pertaining to scenic resources are applicable to the project

LOCAL

SHASTA COUNTY GENERAL PLAN

Shasta County has specific policies on visual or aesthetic resources that apply to TMPP. These issues are addressed in the Shasta County General Plan, Scenic Roadway Element, and Design Review Element and are implemented by the Shasta County Department of Resource Management (Shasta County, 1995). The Scenic Roadway Element of the General Plan provides criteria for establishing State Route 299 as an official scenic highway. The Scenic Roadway Element of the General Plan provides criteria to protect the value of the natural and scenic character of the county's highways. The following guidelines have been developed to protect scenic corridors (State Route 299):

- Setback requirements
- Regulations of building form, material, and color;
- Landscaping with native vegetation, where possible;
- Minimizing grading and cut and fill activities;
- Requiring use of adequate erosion and sediment control programs;
- Siting of new structures to minimize visual impacts from highways;
- Regulation of the type, size, and location of advertising signs;
- Utility lines shall be underground wherever possible; where undergrounding is not practical, lines shall be sited in a manner which minimizes their visual intrusion.

The Design Review Element identifies the following means to achieving and enhancing the natural Environment:

- Use of appropriate building color;
- Fencing and screening;
- Maintenance of viewsheds, and;
- Use of natural vegetation and terrain.

WASTE MANAGEMENT

FEDERAL

RESOURCE CONSERVATION AND RECOVERY ACT - RCRA (42 U.S.C. § 6922)

RCRA establishes requirements for the management of hazardous wastes from the time of generation to the point of ultimate treatment or disposal. Section 6922 requires generators of hazardous waste to comply with requirements regarding:

- Record keeping practices which identify quantities of hazardous wastes generated and their disposition,
- Labeling practices and use of appropriate containers,
- Use of a manifest system for transportation, and
- Submission of periodic reports to the U.S. Environmental Protection Agency or authorized state.

TITLE 40, CODE OF FEDERAL REGULATIONS, PART 260

These sections contain regulations promulgated by the EPA to implement the requirements of RCRA as described above. Characteristics of hazardous waste are described in terms of ignitability, corrosivity, reactivity, and toxicity, and specific types of wastes are listed.

STATE

CALIFORNIA HEALTH AND SAFETY CODE §25100 ET SEQ. (HAZARDOUS WASTE CONTROL ACT OF 1972, AS AMENDED)

This act creates the framework under which hazardous wastes must be managed in California. It mandates the State Department of Health Services (now the Department of Toxic Substances Control under the California Environmental Protection Agency, or Cal EPA) to develop and publish a list of hazardous and extremely hazardous wastes, and to develop and adopt criteria and guidelines for the identification of such wastes. It also requires hazardous waste generators to file notification statements with Cal EPA and creates a manifest system to be used when transporting such wastes.

TITLE 14, CALIFORNIA CODE OF REGULATIONS, §17200 ET SEQ. (MINIMUM STANDARDS FOR SOLID WASTE HANDLING AND DISPOSAL)

These regulations set forth minimum standards for solid waste handling and disposal, guidelines to ensure conformance of solid waste facilities with county solid waste management plans, as well as enforcement and administration provisions.

***TITLE 22, CALIFORNIA CODE OF REGULATIONS, §66262.10 ET SEQ.
(GENERATOR STANDARDS)***

These sections establish requirements for generators of hazardous waste. Under these sections, waste generators must determine if their wastes are hazardous according to either specified characteristics or lists of wastes. As in the federal program, hazardous waste generators must obtain EPA identification numbers, prepare manifests before transporting the waste off-site, and use only permitted treatment, storage, and disposal facilities. Additionally, hazardous waste must only be handled by registered hazardous waste transporters. Generator requirements for record keeping, reporting, packaging, and labeling are also established.

LOCAL

There are no additional local LORS to be considered.

WORKER SAFETY AND FIRE PROTECTION

FEDERAL

Occupational Safety and Health Act of 1970 (29 United States Code sections 651 et seq.).

Occupational Safety and Health Administration Safety and Health regulations (29 Code of Federal Regulations §§ 1910.1 - 1910.1500)

Occupational Safety and Health Act of 1970 (29 United States Code section (USC) (§) 651 et seq.).

29 C.F.R. §1910.120 (HAZWOPER Standard) Defines the regulations for Hazardous Waste Operations and Emergency Response. This section covers the clean-up operations, hazardous materials removal work, corrective actions, voluntary clean-up operations, monitoring, and emergency response required by federal, state, and local agencies of hazardous substances that are present at controlled and uncontrolled hazardous waste sites.

29 C.F.R. §§1910.1 - 1910.1500 (Occupational Safety and Health Administration Safety and Health regulations)

29 C.F.R. §§1952.170 - 1952.175 (Approval of California's plan for enforcement of its own Safety and Health requirements, in lieu of most of the federal requirements found in §§ 1910.1 - 1910.1500)

STATE

California's plan for enforcement of its own Safety and Health requirements is in lieu of most of the federal requirements found in 29 CFR §§ 1952.170 - 1952.175.

- Title 8, California Code of Regulations (CCR), section 450 et seq. (Applicable requirements of the Division of Industrial Safety, including Unfired Pressure Vessel Safety Orders, Construction Safety Orders, Electrical Safety Orders, and General Industry Safety Orders).
- California Building Code, Title 24, CCR, § 501 et seq. The California Building Code is designed to provide minimum standards to safeguard human life, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, etc. of buildings and structures.
- Title 8, CCR, § 5192 (HAZWOPER Standard). Defines the regulations for Hazardous Waste Operations and Emergency Response. This section covers the clean-up operations, hazardous removal work, corrective actions, voluntary clean-up operations, monitoring, and emergency response required by federal,

state, local agencies of hazardous substances that are present at controlled and uncontrolled hazardous waste sites.

LOCAL

1998 Edition of California Fire Code (CFC) and all applicable National Fire Protection Association (NFPA) standards. The fire code contains provisions necessary for fire prevention and information about fire safety, special occupancy uses, special processes, and explosive, flammable, combustible and hazardous materials.

Uniform Fire Code Standards. This is a companion publication to the CFC and contains standards of the American Society for Testing and Materials and of the National Fire Protection Association.

California Building Code. (Cal. Code Regs., Tit. 24, § 501 et seq.) The California Building Code is designed to provide minimum standards to safeguard human life, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, etc. of buildings and structures.

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Appendix B



Proof of Service List

STATE OF CALIFORNIA

Energy Resources Conservation
and Development Commission

In the Matter of:)	Docket No. 99-AFC-2
)	
Application for Certification for the)	PROOF OF SERVICE
Three Mountain Power Project)	
(Ogden Energy, Inc.))	
_____)	

I, _____, declare that on ____ I deposited copies of the attached _____ in the United States mail at Sacramento, CA with first class postage thereon fully prepaid and addressed to the following:

DOCKET UNIT

Send the original signed document plus the required 12 copies to the address below:

**CALIFORNIA ENERGY COMMISSION
DOCKET UNIT, MS-4
Attn: Docket No. 99-AFC-2
1516 Ninth Street
Sacramento, CA 95814-5512**

* * * *

In addition to the documents sent to the Commission Docket Unit, also send individual copies of any documents to:

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I declare, under penalty of perjury, that the foregoing is true and correct.

[signature]

* * * *

INTERNAL DISTRIBUTION LIST

FOR INFORMATION ONLY! Parties **DO NOT** mail to the following individuals. The Energy Commission Docket Unit will internally distribute documents filed in this case to the following:

WILLIAM J. KEESE, Chairman
Presiding Member
MS-32

ROBERT A. LAURIE, Commissioner
Associate Member
MS-31

Ed Bouillon
Hearing Officer
MS-9

Rick Buell
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Appendix C



Exhibit List

**BEFORE THE ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA**

In the Matter of:

**Application for Certification
for the Three Mountain Power
Plant Project**

Docket No. 99-AFC-2

EXHIBIT LIST

EXHIBIT 1: Application for Certification. Three Mountain Power Project 99-AFC-2. Volume 1 – Text: Volume 2 – Appendices A-S, filed March 1999. Sponsored by Applicant; received into evidence on December 19, 2000.

EXHIBIT 2:

- a. Responses of Three Mountain Power, LLC to CEC Staff Data Requests 2-9 and 13-49, filed September 2, 1999.
- b. Responses of Three Mountain Power, LLC to CEC Staff Data Requests 44-50, filed September 13, 1999.
- c. Confidential Response of Three Mountain Power, LLC to CEC Staff Data Requests 46, filed September 13, 1999.
- d. Response of Three Mountain Power, LLC to CEC Staff Data Requests 1, filed October 5, 1999.
- e. Supplemental Response of Three Mountain Power, LLC to CEC Staff Data Requests 33, filed October 6, 1999.
- f. Confidential Second Monthly Status Report of Three Mountain, LLC Regarding Emission Offsets Pursuant to CEC Staff Data Requests 44, filed October 13, 1999.
- g. Responses of Three Mountain Power, LLC to CEC Staff Data Requests 51-70, filed October 14, 1999.
- h. Emission Offsets Proposal of Three Mountain Power, LLC in Response to CEC Staff Data Requests 44, filed October 26, 1999.
- i. Responses of Three Mountain Power, LLC to CEC Staff Data Requests 71-89, filed November 15, 1999.
- j. Responses of Three Mountain Power, LLC to CEC Staff Data Requests 62, 66 and 67, filed November 15, 1999.

- k. Response of Three Mountain Power, LLC to CEC Staff Data Requests 1(a), filed November 16, 1999.
- l. Responses of Three Mountain Power, LLC to CEC Staff Data Requests 90-92, filed November 19, 1999.
- m. Supplemental Response of Three Mountain Power, LLC to CEC Staff Data Requests 78, filed November 24, 1999.
- n. Responses of Three Mountain Power, LLC to CEC Staff Data Requests 93-96, filed November 29, 1999.
- o. Supplemental Response of Three Mountain Power, LLC to CURE Data Requests 17(d) and 19(e), filed December 9, 1999.
- p. Response by Three Mountain Power, LLC to the Four Motions to be Considered on December 20, 1999, filed December 15, 1999.
- q. Responses of Three Mountain Power, LLC to Information Requests in the Preliminary Staff Assessment Part 3 (Soils and Water Resources), filed January 7, 2000.
- r. First Supplemental Response of Three Mountain Power, LLC to Information Requests in the Preliminary Staff Assessment Part 3 (Soils and Water Resources), filed January 10, 2000.

Sponsored by Applicant; received into evidence on December 19, 2000.

EXHIBIT 3: CEC Staff Responses to the Four Motions to be Considered on December 20, 1999, filed December 15, 1999. Sponsored by Applicant; received into evidence on December 19, 2000.

EXHIBIT 4:

- a. Responses of Three Mountain Power, LLC to CURE Data Requests 1-75, filed October 12, 1999.
- b. First Supplemental Response of Three Mountain Power, LLC to CURE Data Requests 10-75, filed November 10, 1999.
- c. Second Supplemental Response of Three Mountain Power, LLC to CURE Data Requests 10-75, filed November 10, 1999.
- d. Supplemental Response of Three Mountain Power, LLC to CURE Data Requests 17(d) and 19(e), filed December 9, 1999.
- e. Response of Three Mountain Power, LLC to CURE Data Request 76, filed January 21, 2000.

Sponsored by Applicant; received into evidence on December 19, 2000.

EXHIBIT 5:

- a. Response of Three Mountain Power, LLC to Burney Resource Group Data Requests 1-21 (Water), filed November 24, 1999.
- b. Responses of Three Mountain Power, LLC to Burney Resource Group Data Requests 1-26 (Air), filed December 6, 1999.
- c. Responses of Three Mountain Power, LLC to Burney Resource Group Data Requests 1-2 (Transmission), filed December 6, 1999.

Sponsored by Applicant; received into evidence on December 19, 2000.

EXHIBIT 6: Responses of Three Mountain Power, LLC to Claude D. Evans Data Requests 1-3, filed December 8, 1999. Sponsored by Applicant; received into evidence on December 19, 2000.

EXHIBIT 7: Direct Testimony of Les Toth regarding Project Description. Sponsored by Applicant; received into evidence on March 21, 2000.

EXHIBIT 8: Direct Testimony of Mai Hattar regarding Transmission Line Safety and Nuisance. Sponsored by Applicant; received into evidence on March 21, 2000.

EXHIBIT 9: Direct Testimony of Linda Hollingsworth regarding Hazardous Materials. Sponsored by Applicant; received into evidence on March 21, 2000.

EXHIBIT 10: Direct Testimony of Valorie Thompson regarding Waste Management. Sponsored by Applicant; received into evidence on March 21, 2000.

EXHIBIT 11: Direct Testimony of Rita Nitka regarding Land Use. Sponsored by Applicant; received into evidence on March 21, 2000.

EXHIBIT 12: Direct Testimony of Paul Miller regarding Traffic & Transportation. Sponsored by Applicant; received into evidence on March 21, 2000.

EXHIBIT 13: Direct Testimony of Rick Tavares regarding Noise. Sponsored by Applicant; received into evidence on December 18, 2000.

EXHIBIT 14: Direct Testimony of Marsha Gale and Ken Richmond regarding Visual Resources. Sponsored by Applicant; received into evidence on March 21, 2000.

- EXHIBIT 15:** Direct Testimony of Danielle Tinman and Christopher Dore regarding Cultural Resources. Sponsored by Applicant; received into evidence on March 21, 2000.
- EXHIBIT 16:** Direct Testimony of Danielle Tinman, Rica Nitka, and Mike Costanza regarding Socioeconomics. Sponsored by Applicant; received into evidence on March 21, 2000.
- EXHIBIT 17:** Direct Testimony of Don Barrie regarding Geology and Paleontology. Sponsored by Applicant; received into evidence on March 21, 2000.
- EXHIBIT 18:** Direct Testimony of Mai Hattar regarding Facility Design. Sponsored by Applicant; received into evidence on March 21, 2000.
- EXHIBIT 19:** Direct Testimony of Mai Hattar regarding Power Plant Efficiency and Reliability. Sponsored by Applicant; received into evidence on March 21, 2000.
- EXHIBIT 20:** Direct Testimony of Byron Tomlinson regarding Transmission System Engineering. Sponsored by Applicant; received into evidence on March 7, 2000.
- EXHIBIT 21:** Direct Testimony of Denise Dagget regarding Worker Safety & Fire Protection. Sponsored by Applicant; received into evidence on March 21, 2000.
- EXHIBIT 22:** Direct Testimony of Martin McFadden regarding General Conditions/Compliance. Sponsored by Applicant; received into evidence on March 21, 2000.
- EXHIBIT 23:** Letter dated July 7, 1999 from Jeffrey C. Miller of the California Independent System Operator to Les Toth regarding the Preliminary Facilities Study, filed August 4, 1999. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 24:** Letter from White & Case, LLP to Burney Resource Group dated and filed October 28, 1999. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 25:** Letter from White & Case, LLP to Burney Resource Group dated and filed November 2, 1999. Sponsored by Applicant; received into evidence on December 19, 2000.

- EXHIBIT 26:** Presentation of Lawrence & Association on behalf of Three Mountain Power, LLC at the November 3, 1999 Staff Workshop, filed November 29, 1999. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 27:** Comments of the SCAQMD on the Burney Resource Group motion for a one-year air quality study and on the Claude Evans motion for mitigation through paving of roads in Johnson Park, filed December 6, 1999. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 28:** Letter to Richard Buell of the CEC from Andrea Redamonti of the California Department of Transportation, dated and filed December 13, 1999. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 29:** Letter of Andrew F. Washington from the California Regional Water Quality Control Board regarding the Three Mountain Power Project, filed December 14, 1999. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 30:** Letter dated March 23, 1999 to Kent Smith of the CEC from Leigh Levine of the California Department of Transportation, filed December 15, 1999. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 31:** Additional Comments of Three Mountain Power regarding Wintertime Air Quality Monitoring, filed December 15, 1999. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 32:** Letter dated June 28, 1999 to Richard Buell of the CEC from Leigh Levine of the California Department of Transportation, filed December 15, 1999. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 33:** Letter dated December 10, 1999 to James Rorhbach, California Regional Water Quality Control Board ("WQCB") from Andrew F. Washington of the Three Mountain Power Project, filed December 22, 1999. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 34:** Letter to Richard Buell of the CEC from Scott Kaminski of the Shasta County Department of Resource Management, dated and filed January 3, 1999. Sponsored by Applicant; received into evidence on December 19, 2000.

- EXHIBIT 35:** Increment Consumption Evaluation prepared by Valorie Thompson, Ph.D. for the Three Mountain Power Project, filed January 6, 2000. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 36:** Offsite Consequence Analysis for the Three Mountain Power Project, filed January 6, 2000. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 37:** Screen 3 Modeling Results for the Three Mountain Power Project, filed January 6, 2000. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 38:** Offsite Consequence Analysis, dated January 6, 2000. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 39:** Preliminary Determination of Compliance, Shasta County Air Quality Management District, filed January 7, 2000. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 40:** Comments of Three Mountain Power, LLC on the Preliminary Staff Assessment, filed January 7, 2000. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 41:** Letter dated January 4, 2000 from James C. Pedri of the RWQCB to Andrew F. Washington, filed January 7, 2000. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 42:** Letter dated January 10, 2000 from Lawrence J. Sullivan of the Burney Fire Protection District to Sierra Pacific Industries, filed January 11, 2000. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 43:** Letters dated January 4, 2000 from Bonnie Lampley to the Del Oro Water Company, the Burney Water District and Burney Mountain Power, filed January 12, 2000. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 44:** Letter dated January 10, 2000 to Les Toth from Nazir Kahn of Fruit Growers Supply Company, filed January 12, 2000. Sponsored by Applicant; received into evidence on December 19, 2000.

- EXHIBIT 45:** Letter Dated November 19, 1999 to Bill Suppa of the Burney Water District from John Andrews of SHN Consulting Engineers & Geologists Providing an Independent Evaluation of the Capacity of the Burney Groundwater Basin to Support Groundwater Use by the Three Mountain Power Project, filed January 18, 2000. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 46:** Modeling Analysis for the Three Mountain Power Project Using Default Meteorologists Data, prepared by Valorie Thompson, Ph.D., filed January 21, 2000. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 47:** Certification of emission limitation compliance history provided by Three Mountain Power, LLC to the SCAQMD, filed January 21, 2000. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 48:** Revised Cooling Tower Drift Analysis and Report on Boron, prepared for the Three Mountain Power Project and filed on January 21, 2000. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 49:** Vendor information regarding oxidation catalysts obtained by Three Mountain Power, LLC and provided to the SCAQMD, filed January 21, 2000. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 50:** Comments of Three Mountain Power, LLC on the Preliminary Determination of Compliance, filed February 2000. Sponsored by Applicant; received into evidence on December 19, 2000.
- EXHIBIT 51:** Testimony of David Larsen regarding TSE. Sponsored by TANC; received into evidence on March 7, 2000.
- EXHIBIT 52:** Testimony of Gregory E. Salyer regarding TSE. Sponsored by TANC; received into evidence on March 7, 2000.
- EXHIBIT 53a:** Letter from PG&E to Cal ISO, dated September 21, 1999. Sponsored by Staff; received into evidence on March 21, 2000.
- EXHIBIT 53b:** Letter from Cal ISO to PG&E, dated November 16, 1999. Sponsored by Staff; received into evidence on March 21, 2000.
- EXHIBIT 53c:** Letter from PG&E to Cal ISO, dated December 17, 1999. Sponsored by Staff; received into evidence on March 21, 2000.

- EXHIBIT 53d:** Letter from Cal ISO to PG&E, dated February 17, 2000. Sponsored by Staff; received into evidence on March 21, 2000.
- EXHIBIT 54:** Cal ISO Testimony of Peter Mackin. Sponsored by Staff; received into evidence on March 7, 2000.
- EXHIBIT 55:** Cal ISO Errata to the Testimony of Peter Mackin. Sponsored by Staff; received into evidence on March 7, 2000.
- EXHIBIT 56:** Final Staff Assessment (FSA), Part 1. Sponsored by Staff; all portions received into evidence on various dates.
- EXHIBIT 57:** Donald S. Barrie Supplemental Testimony regarding Geology. Sponsored by Applicant; received into evidence on March 21, 2000.
- EXHIBIT 58:** John C. Pfeifer Testimony regarding Geology. Sponsored by BRG; received into evidence on March 21, 2000.
- EXHIBIT 59:** Seismic Report. Sponsored by BRG; received into evidence on March 21, 2000.
- EXHIBIT 60:** Ken Richmond Errata to Testimony on Visual Resources. Sponsored by Applicant; received into evidence on March 21, 2000.
- EXHIBIT 61:** David Flores, Revised Testimony on Visual Resources. Sponsored by Staff; received into evidence on March 21, 2000.
- EXHIBIT 62:** Joe Loyer, Testimony on Cooling Tower Plume Visibility Analysis. Sponsored by Staff; received into evidence on March 21, 2000.
- EXHIBIT 63:** Chart and Drawings by Joe Loyer. Sponsored by Staff; received into evidence on March 21, 2000.
- EXHIBIT 64:** FSA, Part 2. Sponsored by Staff; received into evidence on December 18 and 19, 2000.
- EXHIBIT 65:** FSA, Part 3. Sponsored by Staff, received into evidence on December 18 and 19, 2000.
- EXHIBIT 66:** 3 Volumes of direct and supplemental testimony on the FSA, Part 2, dated November 17, 2000. Sponsored by Applicant ; received into evidence on December 18 and 19, 2000.

- EXHIBIT 67:** Staff Rebuttal to BRG Air Quality Testimony, Black Ranch Air Quality Testimony, Applicant Testimony on Noise, and Errata to Staff Air Quality and Biological Resources Testimony, dated December 7, 2000, and Errata to Noise Rebuttal dated December 14, 2000. Sponsored by Staff; received into evidence on December 18 and 19, 2000.
- EXHIBIT 68:** Testimony of J. Robert Murray, on Visual Resources, dated February 17, 2000, with five original photographs. Sponsored by BRG; received into evidence on December 18, 2000.
- EXHIBIT 69:** Rebuttal Testimony of Applicant. Sponsored by Applicant; received into evidence on December 18 and 19, 2000.
- EXHIBIT 70:** Applicant opposition to Burney Resource Group (BRG) request for delay of scheduled hearing dates. Sponsored by Applicant; received into evidence on December 18, 2000.
- EXHIBIT 71:** Letter to Rick Buell from CURE, dated February 7, 2000. Sponsored by BRG; received into evidence on December 18, 2000.
- EXHIBIT 72:** Written Cross examination, and answers, of Obed Odoemelum, on Public Health. Sponsored by BRG; received into evidence on December 18, 2000.
- EXHIBIT 73:** Final Determination of Compliance (FDOC) issued by Shasta County Air Quality Management District, dated October 10, 2000. Sponsored by Staff; received into evidence on December 18, 2000.
- EXHIBIT 74:** Table 3 of FSA with additional 1998 data on Air Quality. Sponsored by BRG. Identified, not received into evidence.
- EXHIBIT 75:** Shasta County 1998 Emissions Inventory. Sponsored by BRG; received into evidence on December 18, 2000.
- EXHIBIT 76:** Written Testimony of Dr. Erbes on Air Quality. Sponsored by Black Ranch; received into evidence on December 18, 2000.
- EXHIBIT 77:** Panel Testimony dated 11/17/00 from Greg Gilbert, Alan Bedwell and Boris Reyes, on Air Quality with attached Exhibits. Sponsored by BRG; received into evidence on December 18, 2000.
- EXHIBIT 78:** Errata to Exhibit 77. Sponsored by BRG; received into evidence on December 18, 2000.

- EXHIBIT 79:** Stipulation between Staff and Applicant, dated 12/7/00 regarding water matters. Sponsored by Staff; received into evidence on December 18, 2000.
- EXHIBIT 80:** Errata to Soil and Water Resources Conditions of Certification, dated December 18, 2000. Sponsored by Staff; received into evidence on December 18, 2000.
- EXHIBIT 81:** Declaration of Dr. Fox. Sponsored by Staff; received into evidence on December 18, 2000.
- EXHIBIT 82:** Dr. Maria Ellis written testimony. Sponsored by BRG; received into evidence on December 19, 2000.
- EXHIBIT 83:** Written Testimony of Jeffrey Cook. Sponsored by BRG; received into evidence on December 19, 2000.
- EXHIBIT 84:** Testimony on Part 3 Topics, Water Resources and Biological Resources. Sponsored by Applicant; received into evidence on December 19, 2000. (NOTE: This exhibit number was assigned by the Committee after conclusion of the Hearings.)
- EXHIBIT 85:** Position of BRG regarding Exhibit 89. Sponsored by BRG; received into evidence on March 6, 2001.
- EXHIBIT 86:** Position of Black Ranch regarding Exhibit 89. Sponsored by Black Ranch; received into evidence on March 6, 2001.
- EXHIBIT 87:** Letter to Chairman Keese, dated February 14, 2001. Sponsored by both Applicant and Staff; received into evidence on March 6, 2001.
- EXHIBIT 88:** Motion to Reopen Record. Sponsored by both Applicant and Staff; received into evidence on March 6, 2001.
- EXHIBIT 89:** Revised Soil and Water Resources Conditions 9-18. Sponsored by both Applicant and Staff; received into evidence on March 6, 2001.
- EXHIBIT 90:** Suggested Language for Presiding Member's Proposed Decision. Sponsored by both Applicant and Staff; received into evidence on March 6, 2001.
- EXHIBIT 91:** Final ATC/PSD. Sponsored by Staff; received into evidence on March 6, 2001.

EXHIBIT 92: Final Biological Opinion. Sponsored by Applicant; received into evidence on March 6, 2001.

EXHIBIT 93: Letter from the EPA to Kussow, dated January 26, 2001. Sponsored by Applicant; received into evidence on March 6, 2001.

EXHIBIT 94: Letter from the EPA to Kussow, dated February 15, 2001. Sponsored by Applicant; received into evidence on March 6, 2001.

EXHIBIT 95: Declarations and Qualifications of Linda Bond, Richard Buell, and Martin McFadden. Sponsored by both Applicant and Staff; received into evidence on March 6, 2001.

EXHIBIT 96: Revised Soil and Water Resources Condition 4. Sponsored by Staff; received into evidence on March 6, 2001.

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Appendix D

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Glossary of Terms and Acronyms

GLOSSARY OF TERMS AND ACRONYMS

A		BARCT	Best Available Retrofit Control Technology
A	Ampere	bbl	barrel
AAL	all aluminum (electricity conductor)	BCDC	Bay Conservation and Development Commission
AAQS	Ambient Air Quality Standards	BCF	billion cubic feet
ABAG	Association of Bay Area Governments	Bcfd	billion cubic feet per day
AC	alternating current	b/d	barrels per day
ACE	Argus Cogeneration Expansion Project Army Corps of Engineers	BLM	Bureau of Land Management
ACSR	aluminum covered steel reinforced (electricity conductor)	BPA	U.S. Bonneville Power Administration
AFC	Application for Certification	BR	Biennial Report
AFY	acre-feet per year	Btu	British thermal unit
AHM	Acutely Hazardous Materials	C	
ANSI	American National Standards Institute	CAA	U.S. Clean Air Act
APCD	Air Pollution Control District	CAAQS	California Ambient Air Quality Standards
APCO	Air Pollution Control Officer	CALEPA	California Environmental Protection Agency
AQMD	Air Quality Management District	CALTRANS	California Department of Transportation
AQMP	Air Quality Management Plan	CAPCOA	California Air Pollution Control Officers Association
ARB	Air Resources Board	CBC	California Building Code
ARCO	Atlantic Richfield Company	CCAA	California Clean Air Act
ASAE	American Society of Architectural Engineers	CDF	California Department of Forestry
ASHRAE	American Society of Heating Refrigeration & Air Conditioning Engineers	CDFG	California Department of Fish and Game
ASME	American Society of Mechanical Engineers	CEERT	Coalition for Energy Efficiency and Renewable Technologies
ATC	Authority to Construct	CEM	continuous emissions monitoring
B		CEQA	California Environmental Quality Act
BAAQMD	Bay Area Air Quality Management District	CESA	California Endangered Species Act
BACT	Best Available Control Technology	CFB	circulating fluidized bed
BAF	Basic American Foods	CFCs	chloro-fluorocarbons
		cfm	cubic feet per minute

CFR	Code of Federal Regulations
cfs	cubic feet per second
CLUP	Comprehensive Land Use Plan
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO ₂	carbon dioxide
COI	California Oregon Intertie
CPCN	Certificate of Public Convenience & Necessity
CPM	Compliance Project Manager
CPUC	California Public Utilities Commission
CT	combustion turbine current transformer
CTG	combustion turbine generator
CURE	California Unions for Reliable Energy
	D
dB	decibel
dB(A)	decibel on the A scale
DC	direct current
DCTL	Double Circuit Transmission Line
DEIR	Draft Environmental Impact Report
DEIS	Draft Environmental Impact Statement
DFG	California Department of Fish and Game
DHS	California Department of Health Services
DISCO	Distribution Company
DOC	Determination of Compliance
DOE	U.S. Department of Energy
DSM	demand side management
DTC	Desert Tortoise Council
DWR	California Department of Water Resources

	E
EDF	Environmental Defense Fund
Edison	Southern California Edison Company
EDR	Energy Development Report
EFS&EPD	Energy Facilities Siting and Environmental Protection Division
EIA	U.S. Energy Information Agency
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ELFIN	Electric Utility Financial and Production Simulation Model
EMF	electric and magnetic fields
EOR	East of River (Colorado River)
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
ER	Electricity Report
ERC	emission reduction credit {offset}
ESA	Endangered Species Act (Federal) Environmental Site Assessment
ETSR	Energy Technologies Status Report
	F
FAA	Federal Aviation Administration
FBE	Functional Basis Earthquake
FCAA	Federal Clean Air Act
FCC	Federal Communications Commission
FEIR	Final Environmental Impact Report
FIP	Federal Implementation Plan
FONSI	Finding of No-Significant Impact
FERC	Federal Energy Regulatory Commission
FSA	Final Staff Assessment
	G

GEP	good engineering practice	KGRA	known geothermal resource area
GIS	gas insulated switchgear geographic information system	km	kilometer
gpd	gallons per day	KOP	key observation point
gpm	gallons per minute	KRCC	Kern River Cogeneration Company
GW	gigawatt	kV	kilovolt
GWh	gigawatt hour	KVAR	kilovolt-ampere reactive
	H	kW	kilowatt
H ₂ S	hydrogen sulfide	kWe	kilowatt, electric
HCP	habitat conservation plan	kWh	kilowatt hour
HHV	higher heating value	kWp	peak kilowatt
HRA	Health Risk Assessment		L
HRSG	heat recovery steam generator	LADWP	Los Angeles Department of Water and Power
HV	high voltage	LAER	Lowest Achievable Emission Rate
HVAC	heating, ventilating and air conditioning	lbs	pounds
	I	lbs/hr	pounds per hour
IAR	Issues and Alternatives Report	lbs/MMBtu	pounds per million British thermal units
IEA	International Energy Agency	LCAQMD	Lake County Air Quality Management District
IEEE	Institute of Electrical & Electronics Engineers	LMUD	Lassen Municipal Utility District
IID	Imperial Irrigation District	LORS	laws, ordinances, regulations and standards
IIR	Issues Identification Report		M
IOU	Investor-Owned Utility	m (M)	meter, million, mega, milli or thousand
IS	Initial Study	MBUAPCD	Monterey Bay Unified Air Pollution Control District
ISO	Independent System Operator	MCE	maximum credible earthquake
	J	MCF	thousand cubic feet
JES	Joint Environmental Statement	MCL	Maximum Containment Level
	K	MCM	thousand circular mil (electricity conductor)
KCAPCD	Kern County Air Pollution Control District	µg/m ³	micro grams (10 ⁻⁶ grams) per cubic meter
KCM	thousand circular mils (also KCmil) (electricity conductor)		

MEID	Merced Irrigation District	NOP	Notice of Preparation (of EIR)
MG	milli gauss	NOV	Notice of Violation
mgd	million gallons per day	NRDC	Natural Resources Defense Council
MID	Modesto Irrigation District	NSCAPCD	Northern Sonoma County Air Pollution Control District
MOU	Memorandum of Understanding	NSPS	New Source Performance Standards
MPE	maximum probable earthquake	NSR	New Source Review
m/s	meters per second		O
MS	Mail Station	O ₃	Ozone
MVAR	megavolt-ampere reactive	OASIS	Open Access Same-Time Information System
MW	megawatt (million watts)	OCB	oil circuit breaker
MWA	Mojave Water Agency	OCSG	Operating Capability Study Group
MWD	Metropolitan Water District	O&M	operation and maintenance
MWh	megawatt hour	OSHA	Occupational Safety and Health Administration (or Act)
MWp	peak megawatt		P
N		PG&E	Pacific Gas & Electric Company
N-1	one transmission circuit out	PDCI	Pacific DC Intertie
N-2	two transmission circuits out	PHC(S)	Prehearing Conference (Statement)
NAAQS	National Ambient Air Quality Standards	PIFUA	Federal Powerplant & Industrial Fuel Use Act of 1978
NCPA	Northern California Power Agency	PM	Project Manager particulate matter
NEPA	National Energy Policy Act National Environmental Policy Act	PM ₁₀	particulate matter 10 microns and smaller in diameter
NERC	National Electric Reliability Council	PM _{2.5}	particulate matter 2.5 microns and smaller in diameter
NESHAPS	National Emission Standards for Hazardous Air Pollutants	ppb	parts per billion
NMHC	nonmethane hydrocarbons	ppm	parts per million
NO	nitrogen oxide	ppmvd	parts per million by volume, dry
NOI	Notice of Intention	ppt	parts per thousand
NOL	North of Lugo	PRC	California Public Resources Code
NO _x	nitrogen oxides		
NO ₂	nitrogen dioxide		

PSD	Prevention of Significant Deterioration	SCAQMD	South Coast Air Quality Management District
PSRC	Plumas Sierra Rural Electric Cooperative	SCE	Southern California Edison Company
PT	potential transformer	SCFM	standard cubic feet per minute
PTO	Permit to Operate	SCH	State Clearing House
PU	per unit	SCIT	Southern California Import Transmission
PURPA	Federal Public Utilities Regulatory Policy Act of 1978	SCR	Selective Catalytic Reduction
PV	Palo Verde photovoltaic	SCTL	single circuit transmission line
PX	Power Exchange	SDCAPCD	San Diego County Air Pollution Control District
Q		SDG&E	San Diego Gas & Electric Company
QA/QC	Quality Assurance/Quality Control	SEPCO	Sacramento Ethanol and Power Cogeneration Project
QF	Qualifying Facility	SIC	Standard industrial classification
R		SIP	State Implementation Plan
RACT	Reasonably Available Control Technology	SJVAB	San Joaquin Valley Air Basin
RDF	refuse derived fuel	SJVAQMD	San Joaquin Valley Air Quality Management District
ROC	Report of Conversation reactive organic compounds	SMAQMD	Sacramento Metropolitan Air Quality Management District
ROG	reactive organic gas	SMUD	Sacramento Municipal Utility District
ROW	right of way	SMUDGE	SMUD Geothermal
RWQCB	Regional Water Quality Control Board	SNCR	Selective Noncatalytic Reduction
S		SNG	Synthetic Natural Gas
SACOG	Sacramento Area Council of Governments	SO ₂	sulfur dioxide
SANBAG	San Bernardino Association of Governments	SO _x	sulfur oxides
SANDAG	San Diego Association of Governments	SO ₄	sulfates
SANDER	San Diego Energy Recovery Project	SoCAL	Southern California Gas Company
SB	Senate Bill	SONGS	San Onofre Nuclear Generating Station
SCAB	South Coast Air Basin	SPP	Sierra Pacific Power
SEGS	Solar Electric Generating Station	STIG	steam injected gas turbine
SCAG	Southern California Association of Governments		

SWP	State Water Project	UDC	Utility Displacement Credits
SWRCB	State Water Resources Control Board	UDF	Utility Displacement Factor
	T	UEG	Utility Electric Generator
TAC	Toxic Air Contaminant	USC(A)	United States Code (Annotated)
TBtu	trillion Btu	USCOE	U.S. Corps of Engineers
TCF	trillion cubic feet	USEPA	U.S. Environmental Protection Agency
TCM	transportation control measure	USFS	U.S. Forest Service
TDS	total dissolved solids	USFWS	U.S. Fish and Wildlife Service
TE	transmission engineering	USGS	U.S. Geological Survey
TEOR	Thermally Enhanced Oil Recovery		V
TID	Turlock Irrigation District	VCAPCD	Ventura County Air Pollution Control District
TL	transmission line or lines	VOC	volatile organic compounds
T-Line	transmission line		W
TOG	total organic gases	W	Watt
TPD	tons per day	WAA	Warren-Alquist Act
TPY	tons per year	WEPEX	Western Energy Power Exchange
TS&N	Transmission Safety and Nuisance	WICF	Western Interconnection Forum
TSE	Transmission System Engineering	WIEB	Western Interstate Energy Board
TSIN	Transmission Services Information Network	WOR	West of River (Colorado River)
TSP	total suspended particulate matter	WRTA	Western Region Transmission Association
	U	WSCC	Western System Coordination Council
UBC	Uniform Building Code	WSPP	Western System Power Pool